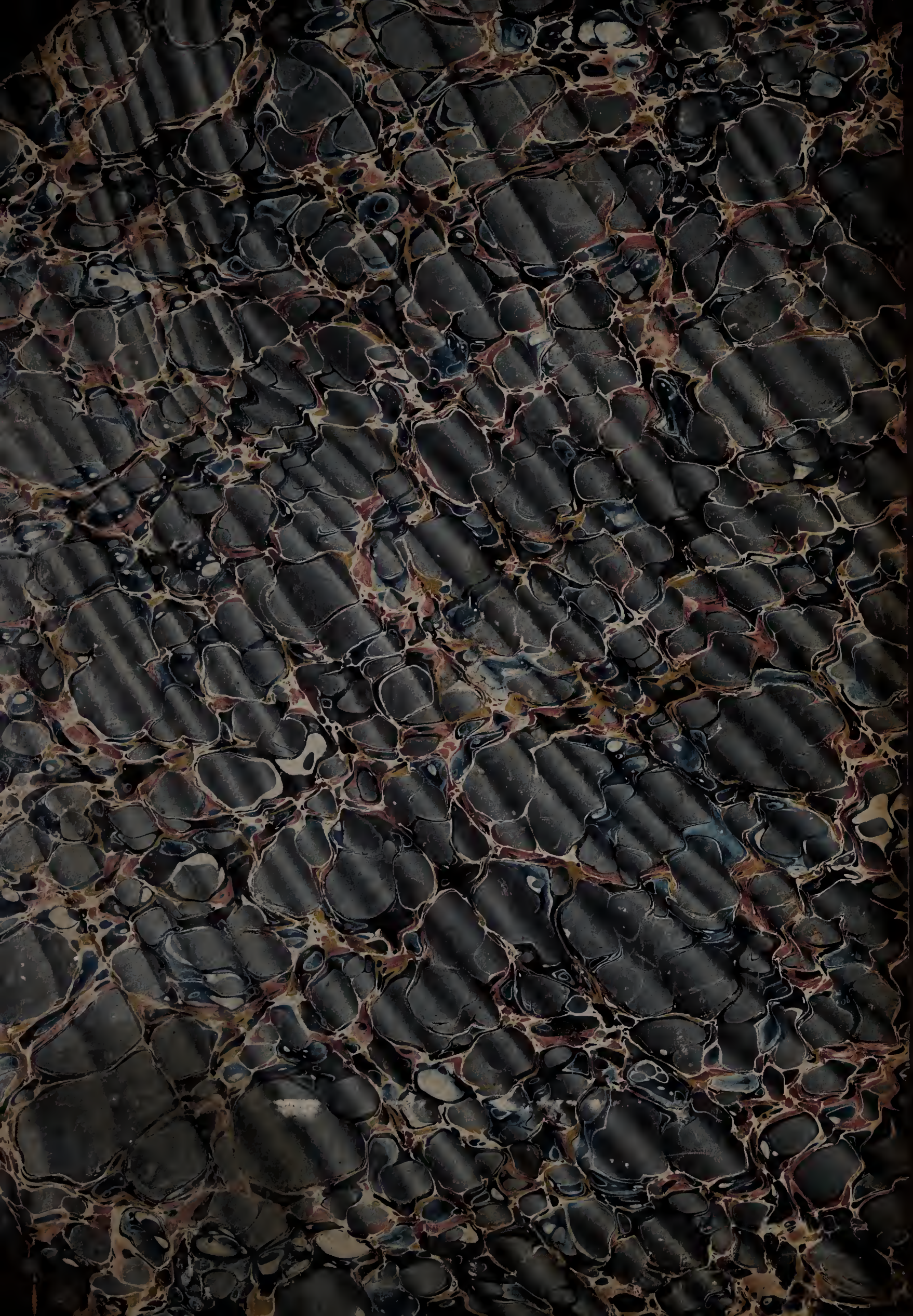

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THE

BUILDER'S GUIDE;

OR

A PRACTICAL TREATISE ON THE SEVERAL ORDERS

OF

GRECIAN AND ROMAN ARCHITECTURE,

TOGETHER WITH THE

GOTHIC STYLE OF BUILDING;

CONSTITUTING A COMPLETE EXPOSITION OF THE

MOST MODERN AND APPROVED METHODS

ADOPTED BY SKILFUL ARCHITECTS IN THE VARIOUS DEPARTMENTS OF

CARPENTRY, JOINERY, MASONRY AND SCULPTURE,

EMBRACING ALL THEIR NECESSARY DETAILS,

AND BY A PLAIN AND COMPREHENSIVE ARRANGEMENT,

PARTICULARLY ADAPTED TO THE WANTS OF THE LESS EXPERIENCED.

ILLUSTRATED AND EMBELLISHED WITH

SEVENTY FOLIO PLATES.

DRAWN ON A LARGE SCALE.

BY CHESTER HILLS,
PRACTICAL ARCHITECT.

IN TWO VOLUMES. VOL. I.

New-York:
PUBLISHED BY DAVID APPLETON & CO.
200 *Broad Way.*
1836.

TO THE PUBLIC.

Although there are numerous Treatises on Architecture already before the public,----yet, from the limited character of many of these works, the cursory manner in which they treat on that which is most essential, and oftentimes the entire omission of what is indispensably requisite to a full developement of this, the most important of the Arts, much embarrassment, perplexity and discouragement have arisen.

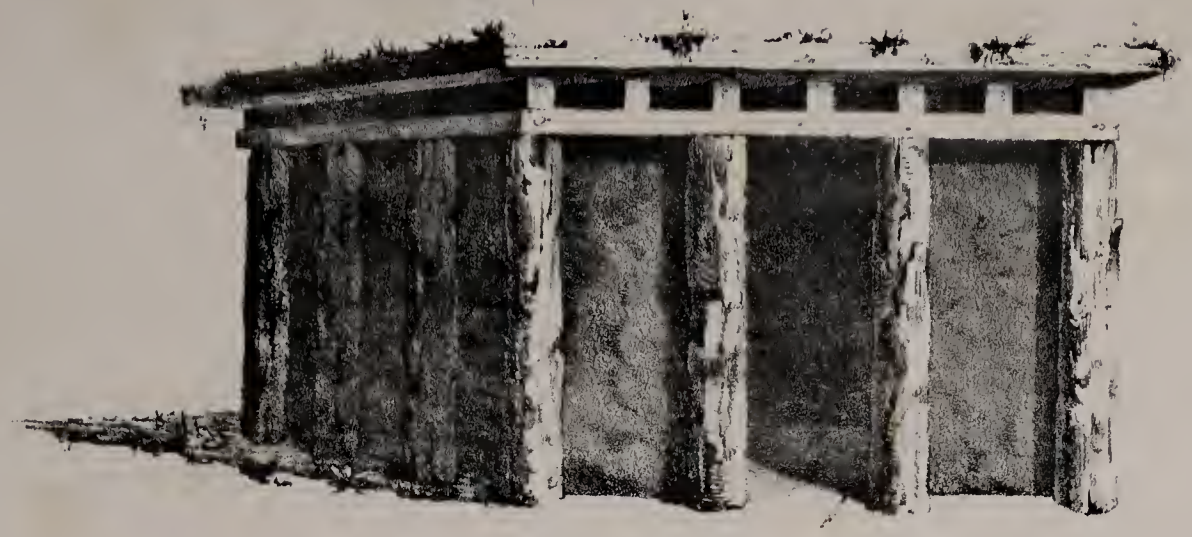
For the want of a work on a large and comprehensive plan, judiciously arranged, and embracing all the most approved modern modifications of Grecian and Roman Architecture, Taste, left unguided, has become corrupt, and consequently the progress of the Science in this country seriously impeded.

In preparing this work, the author has availed himself of all possible means to render it such as the exigences of artists and a correction of the public taste imperatively demand.

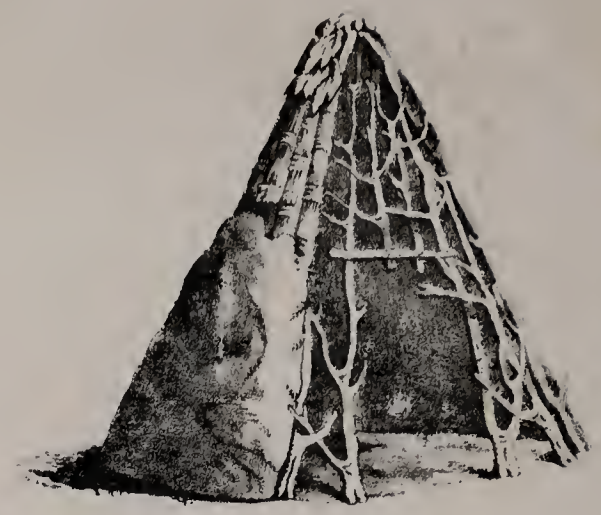
The Practical, as well as the Theoretical Builder, will observe that no pains have been spared to embody in these volumes every thing which essentially pertains to their profession; and although they are intended to illustrate, by plates and otherwise, architectural models in the most general and comprehensive manner, the details (in which most works are lamentably deficient) are set forth with clearness and precision. In following out the particulars, the author designed to aid *especially* the less experienced Builders; and from the facilities which these his labors will afford, and the low price at which they are offered, he rests assured they will meet the approbation and the patronage of an enlightened Public. With these considerations, the work is respectfully submitted, by their

Humble Servant,

THE AUTHOR.



The second sort of Huts



The First sort of Huts.

The third sort of Huts.

Origin of the Corinthian Capital.

THE BUILDER'S GUIDE.

THE ORIGIN AND PROGRESS OF BUILDING.

Buildings were certainly among the first wants of mankind ; and architecture must, undoubtedly, be classed among the earliest antediluvian arts. Scripture informs us that Cain built a city ; and soon after the deluge we hear of many cities, and of an attempt to build a tower that should reach the sky ; a miracle stopped the progress, and prevented the completion of that bold design.

The first men living in a warm climate, wanted no habitations ; every grove afforded shade from the rays of the sun, and shelter from the dews of the night ; rain fell but seldom, nor was it ever sufficiently cold to render closer dwellings than groves either desirable or necessary, even in the hours of repose ; they fed upon the spontaneous productions of the soil, and lived without care, as without labor. But when the human species increased, and the produce of the earth, however luxuriant, was insufficient to supply the requisite food ; when frequent disappointments drew on contention, with all its train of calamities—then separation became necessary, and colonies dispersed to different regions, where frequent rain-storms, and piercing cold, forced the inhabitants to seek for better shelter than trees.

At first, they most likely retired to caverns, formed by nature in rocks, to hollow trunks of trees, or to holes dug by themselves in the earth; but, soon disgusted with the damp and darkness of these habitations, they began to search after more wholesome and comfortable dwellings.

The animal creation pointed out both materials and manners of construction ; swallows, rooks, bees, and storks, were the first builders. Man observed their instinctive operations: he admired, he imitated ; and, being endued with reasoning faculties, and of a structure suited to mechanical purposes, he soon exceeded his masters in the builder's art.

Rude and unseemly, doubtless, were the first attempts ; without experience or tools, the builder collected a few boughs of trees, spread them in a conic shape, and, covering them with rushes or leaves and clay, formed his hut, sufficient to shelter its hardy inhabitants at night, or in seasons of bad weather. But in the course of time, men naturally grew more expert ; they invented tools to shorten and improve labor; fell upon neater, more durable modes of construction ; and forms better adapted than the cone, to the purposes for which their huts were intended : they felt the want of convenient habitations, wherein to taste the comforts of privacy, to rest securely, and be effectually screened from troublesome excesses of weather ; they wanted room to exercise the arts, to which necessity had given birth ; to deposit the grain that agriculture enabled them to raise in abundance ; to secure the flocks which frequent disappointments in the chase forced them to collect and domesticate. Thus stimulated, their fancy and hands went arduously to work, and the progress of improvement was rapid.

That the primitive hut was of a conic figure it is reasonable to conjecture ; for of that form do the American aborigines build their wigwams ; and from its being simplest of the solid forms, and most easily constructed. And wherever wood was found, they probably built in the manner above described ; but, soon as the inhabitants discovered the inclined sides, and the want of upright space in the cone, they changed it for the cube ; and as it is supposed, proceeded in the following manner.

Having, says Vitruvius,* marked out the space to be occupied by the hut, they fixed in the ground several upright trunks of trees to form the sides, filling the intervals between them with branches, closely interwoven and spread over with clay. The sides thus completed, four beams were laid on the upright trunks, which, being well fastened together at the angles of their junction, kept the sides firm, and likewise served to support the covering, or roof of the building, composed of smaller trees, placed horizontally like joists ; upon which, were laid several beds of reeds, leaves, and earth, or clay.

By degrees, other improvements took place ; and means were found to make the fabric lasting, neat and handsome, as well as convenient. The bark and other protuberances were taken from the trees that formed the sides ; these trees were raised above the dirt and humidity, on stones ; were covered at the top with other stones, and firmly bound round at both ends with ozier, or cords, to secure them from splitting. The spaces between the joists of the roof, were closed up with clay or wax, and the ends of them either smoothed or covered with boards. The different beds of materials that composed the covering, were cut straight at the eaves, and distinguished from each other by different projections. The form of the roof, too, was altered ; for being, on account of its flatness, unfit to throw off the rains which sometimes fell in great abundance, it was raised in the middle, on trees disposed like rafters, after the form of a gable roof.

This construction, simple as it appears, probably gave birth to most of the parts that now adorn our buildings ; particularly to the orders, which may be considered as the basis of the whole decorative part of architecture ; for when structures of wood were set aside, and men began to erect solid, stately edifices of stone, having nothing nearer to imitate, they naturally copied the parts which necessity introduced in the primitive hut ; insomuch that the upright trees, with the stones and cordage at each end of them, were the origin of columns, bases, and capitals ; the beams and joists, gave rise to architraves and friezes, with their triglyphs and metopes ; and the gable roof was the origin of pediments ; as the beds of materials, forming the covering, and the rafters supporting them, were of cornices; with their corona, their mutules, modillions, and dentils.

That trees were the originals of columns, seems evident from some very ancient Egyptian ruins still existing, in which are seen columns composed of many small trees tied together with bandages, to form one strong pillar, which before stone was in use, became a necessary operation in a country where no large timber was to be had, and in which the stupendous size of their structures constituted the principal merit. Herodotus describes a stately stone building which stood in the court of the Temple of Minerva at Sais, the columns of which were made to imitate palm trees.

The form of the bundle pillar above mentioned, though deriving its existence from necessity, is far from disagreeable : it was evidently a beauty in the eyes of the ancient Egyptians, since it was imitated by them in stone ; and it seems more natural to suppose that fluted columns owe their origin to the intermediate hollows between the trees composing these pillars, than to the folds of a woman's garment, to which they have but very little resemblance.

Vitruvius, the only remaining ancient writer upon the decorative part of architecture, ascribes almost every invention in that art to the Greeks ; as if, till the time of Dorus, it had remained in its infant state, and nothing had till then appeared worth notice ; and most, if not all the modern authors, have echoed the same doctrine. Yet, if ancient history be credited,* the Egyptians, Assyrians, Babylonians, and other nations of remote antiquity, had exhibited wonders in the art of building, even before the Grecians were a people.

It must indeed be confessed, though the works of the Asiatic nations were astonishing in point of size and extent, yet in other respects they were of a nature calculated rather to give a high idea of the power and wealth of the founders, than of their skill or taste. We plainly see that all their notions of grandeur were confined to dimension ; and all their ideas of elegance or beauty, to richness of materials, or gaudiness of colouring. We observe a barrenness of fancy in their compositions, a simplicity and sameness in their forms, peculiar to primitive inventions ; but, even in the early works of the Egyptians, besides their prodigious dimensions, there are evident marks of taste and fancy ; it is in them we trace the first ornamental forms in Architecture, and to their builders we are most probably indebted for the invention of columns, bases, capitals, and entablatures. We likewise read of roofs supported by figures of colossal men and animals, in the works of the Egyptians, several ages before the introduction of Persians or Caryatides in the structures of Greece ; and of Temples adorned with stately porticos, enriched with columns and sculpture, and built before there were any Temples in Greece.

Hence it may be inferred, that the Grecians were not the inventors of ornamental Architecture, but had that art, as well as their religion and gods, from the Egyptians, or from the Phœnicians, their nearer neighbors—whose skill in the arts is said to have been anterior to theirs, though both were of Egyptian origin.

Diodorus Siculus observes, that the Egyptian priests proved, both by their sacred records, and by other undoubted testimonies, that not only the poets and philosophers of Greece travelled anciently into Egypt to collect their knowledge, but also their architects and sculptors ; and that every thing in which the Grecians excelled, and for which they were famous, was originally carried from Egypt into Greece.

The Phœnicians, however, were very early celebrated for their proficiency in the arts of design ; and there is no doubt but that the Greeks availed themselves of their inventions.

We are told that Hiram made two capitals for the pillars of Jachin and Boaz in Solomon's Temple, which as far as can be collected from the accounts given of them in several parts of Scripture, very much resembled the Corinthian capitals both in form and proportions, though executed some centuries before Chalimachus is reported by Virtruvius to have invented them at Corinth.

The Cherubim of Hiram, too, or the colossal figures of men and animals in the structures of the Egyptians were prior inventions ; and undoubtedly suggested to the Greeks their ideas of Persians and Caryatides.

And though Architecture is certainly indebted to the Grecians for considerable improvements, yet it may with confidence be averred, that they never brought the art to its utmost degree of excellence.

The art of building, says Leon Baptista Alberti, "sprung up and spent its adolescent state in Asia ; after a certain time it flowered in Greece, and finally acquired perfect maturity in Italy, among the Romans." And whether we call to mind the descriptions given by ancient writers of Ninevah, Babylon, Thebes, Memphis, the Egyptian pyramids, the sepulchres of their kings, their temples, and other public monuments ; or contemplate among the Roman works, their palaces, amphitheatres, baths, villas, bridges, mausoleums, and numerous other yet existing testimonies of their splendor, it must candidly be confessed that the Grecians have been far excelled by other nations, not only in the magnitude and grandeur of their structures, but likewise in point of fancy, ingenuity, variety, and elegant selection.

* Markus Pollio Vitruvius, a Roman Architect, the first writer on architecture of whom we have any knowledge. He flourished about fifteen years before the Christian era.

* See the sacred Scriptures, Homer, Strabo, Diodorus Siculus, Pausanius, Pliny, Justin, and Quintus Curtius.

AN ESSAY
ON THE PRINCIPLES OF DESIGN IN ARCHITECTURE.

The natural laws upon which Architecture is founded, the principles that govern its designs, and the good sense that directs its application, are serious subjects of inquiry for the student; for from these sources the noble works of antiquity emanated, and by means of such studies our great and intellectual predecessors distinguished themselves, and have become entitled to our gratitude and admiration.

Rules, indeed, like buoys in marine harbors, point out the safest course, and teach the student to avoid the dangers that might otherwise impede his progress. But if he would imitate the circumnavigator, and launch into the ocean of his art beyond the beacons that surround its shore, he must learn to sound the depths of science for himself: for should the artist be satisfied with merely following the track of others, and adopting their models as his sole rule of guidance; content himself with such limited results, his hopes can have little chance of being realized, and he must not expect his labors to receive the approbation of posterity.

Unfortunately for the advancement of Architecture, it is commonly supposed that it is wholly directed by established rules; that the five orders, as they are called, are precise ordinances, from which it would be heresy to depart; and that the Architect has little more to do than follow the rules laid down in books, or copy from ancient examples, and, by an easy transposition, make new designs from them, in a way quite as dependant on the fancy as on the judgment—when, in fact, his duty is to explore the treasures with which the vestiges of antiquity and the best works abound, viewing them not as documents and patterns merely, but as invaluable manifestations of mind, in which may be read the very thoughts of their authors, and where may be found the reasonings upon which they acted; thence deducing principles and rules for controlling and directing those exuberances of fancy, with which he who reasonably hopes to become a great architect should be gifted.

Nor is it sufficient that the student should be skilled in superadding the *beau ideal* to suitableness, and to the laws of composition, proportion, light, shadow, and color; this, indeed, will make the artist; but he must be well instructed in the sciences, industrious in tracing causes through effect,—and above all, he must be laborious in applying the results of these to his other studies, always remembering, that neither an acquaintance with the science of building, nor the unassisted qualifications of an artist, will constitute him an architect; but that it is the union of both which alone can give a real claim to distinction.

In Architecture, no style of art is held in reverence in which the character is not correspondent with a great or worthy object, and which does not require the operation of a highly cultivated mind, both as relates to the theory of beauty, and the employment of the principles of science.

Nothing seems so much to have puzzled those who have little information on the subject, as the fact, that there are but three Orders in Architecture—for virtually there are no more; and Architects incur the censure of dullness, because many others have not been invented. If, however, it be considered that the orders are but compositions constituted of two characters—masculine vigor, and femenine delicacy, as in the Doric and Corinthian—and these qualities become united, as it were, in the matronly Ionic or middle Order, we shall no more expect the addition of another order than that of a new color to the primitive ones, or of a new note to the musical scale. The Tuscan and Composite—reckoned among the Roman Orders—are merely modifications of the Doric and Corinthian.

The dimensions of columns may naturally be supposed to have engaged the architects of early times; accordingly, upon reference to the best examples, it will be found, that columns were considered to be of proper height and substance when they corresponded with the height and substance of walls; and like them, were made to diminish, so as to maintain a proper solidity, without surcharging the lower strata with unnecessary weight—as if a range of pillars were merely portions of a wall, having regular omissions, called intercolumniations. It will be observed, that this outer open walling, if it may be so called: (see essay plate 4, plan of Temples,) eventually forming the peristyle of the Greek Temple, was not less adequate to support the superstructure, or entablature, and a portion of roof overhanging the cell of the Temple, than were the walls to bear the superincumbent roof, of which they were the actual support. Viewing this as a guide by which the columns of such temple, might have been governed, we see the cause of a relative proportion between the columns and the building as a whole, and eventually the reason why this decorative feature in Architecture determines the proportion in every other part of the structure, and infer that all should be designed with reference to its magnitude and character.

That the quantity of the entablature should be proportioned to the columns is evident, from the defect that must occur if the latter were not sufficient to support it, and from the offence that would arise to the mind, if the column should have to support a weight to which it was seemingly inadequate. On this principle of reciprocal relativeness, the height of the entablature in the Grecian Orders is proportioned. Thus, it is not governed by the height of the column, but by its thickness or diameter. In Grecian Architecture, therefore the thickest columns bear the largest entablature and the slender support the smallest.

In Roman Architecture, this has not always been observed, and still less by the Italian architects. In general, the practice of attaching columns to walls seems to have operated in reducing the height of the entablature; its proportions under these circumstances would necessarily alter, for the Order thence becomes an ornamental feature merely, instead of being an essential portion of the building.

It has been a favorite theory, that the wooden transoms, beam-ends, and rafters of some early buildings, were the precursors of the chief decorations given to the Doric entablature, (see plate of primitive buildings,) and perhaps there is no good reason to impugn the theory. That the useful and agreeable, formed the ground work upon which the early architects engrafted that which has become acknowledged beauty, is very evident; and we cannot do better than follow such admirable examples, and never separate the one from the other.

That timber construction preceded the erection of large buildings in stone, is very probable; and also, that the latter were roofed and decorated with timber, long before the ingenuity of man had contrived the mechanical means of separating from the native rock, and of raising masses of stone, of length and size sufficient to become substitutes for wood. It is, moreover, reasonable to suppose, that in all countries, the means and materials which presented themselves would influence the style and character of buildings, and that, where, as in the case of materials, they were not in themselves adequate to the end proposed, the ingenuity of the architect would contrive to further the object he had in view. How far the invention of the Arch, a subject of repeated investigation, depended on circumstances requiring the aid of man to substitute construction for quantity, is not so much a matter of speculation, as are the time and place of its invention: but it probably originated where large and ponderous materials had been long employed; and in point of time, after large spaces had been already covered by such means. The progressive nature of Art and Science, warrants the conclusion, and experience proves, that the greatest effort in both, generally takes place soon after the consummation of some great success, the result of which approximates to the objects required. Whether the Greeks were acquainted with the construction of the arch or not, when the Temples in question were erected, is not evident; in those works certainly this contrivance does not appear, and so far as linear arrangement and propriety go, as certainly they would not have employed the arch form in the elevations of those buildings; for they would have felt that it was debased when applied to places which did not require its aid, and where its form could not harmonize with the accompanying objects. Bridges and aqueducts, among the ancients, presented a real demand for arches, and the way was prepared for the attempt, in the stupenduous works that are admitted to have preceded the invention. The general application of the Arch allowed the employment of small sized materials, and the Romans finding it convenient in many of their public works to use them in easily portable weights, the arch consequently became a common form in Roman Architecture. After the desolation of Rome, it was for the same reason adopted by her northern conquerors, and thus the Saxon and Gothic styles were made to abound with arches, and the spandril-arched forms, which constitute their peculiar characters.

After the local circumstances of climate, materials, and good sense, had combined and done much towards forming the noble Temples of the ancients; the Greeks became solicitous to give importance to their works, but not by means of magnitude alone, created by heaping stone upon stone, as they had seen in the stupendous buildings of Egypt and neighboring countries, and which excited wonder chiefly on account of the manual labor bestowed upon them. They were desirous on the other hand, that the works in question should become admirable in themselves, as manifestations of genius and operations of the mind, to which materials and labor of the hand were merely assistant, just as other materials are aiding to the poet, and without which his thoughts cannot be read by others, or delivered to posterity with advantage. This laudable desire was accomplished during the administration of Pericles, and perfected by the great architect and sculptor, Phidias. One artist, however, ought not to monopolize all these honors, when so much is due to many who preceded, and to many contemporary artists, as well as to the taste and genius of the people, who had feeling to relish and judgment to applaud their admirable exertions.

The best Greek Temples are admitted to afford the most perfect examples in Architecture; and in these we may therefore, first, and perhaps with the greatest advantage, seek the principles upon which the Grecian architects designed their works. It is impossible to view even a model of one of their fine examples, without perceiving that unity of design pervades the whole, and that it is aided by the arrangement, form, and embellishment of the minor parts. The first, simple as it appears, was not the effect of chance, for we know that chance rarely produces excellence in art, and that the commission of a single error is capable of marring it. By this conformity and consequent unity, a principle followed by the Greeks is developed; and whether it originated in the contemplation of the purpose to which the Temple was destined, or whether they considered this semblance of unity to be essential to grandeur, the result is still the same; for we discover in it a source from which we can obtain an effect of sublimity, not dependent on actual magnitude, however much it may be *assisted* by that imposing circumstance; and thence we may learn to design other works, of whatever form, and suitable to whatever purpose we may desire, possessing a quality that we know to be essential in a noble building.

Towards obtaining this unity of effect and character, the combining quality of the roof is obviously necessary in the Greek Temple; it combines in one span the cell, the portico, and the peristyle, without which they would be viewed as parts merely, and to which the steps, or base supporting the whole, greatly contributes.

To complete this unity of effect, only one approach was obvious, under any view of the building; indeed, so carefully was this principle attended to, that on the flanks of the edifice the spaces were ranged in even numbers, so that the column was placed in the middle of its length, and not an intercolumniation (see plate 4, order of Temples); whilst the actual approach was always decidedly indicated by a central opening in the portico, and by the centre-marking character of the pediment.

In the linear composition of these Temples, the architects aimed at obtaining a distinct character in the front and flanks of the building, to prevent the monotony that would otherwise occur. In the portico, the horizontal effect which obviously prevails in those edifices is obliged to yield to the vertical lines formed by the pillars and by the intercolumniations, which also operate as forms, and to the added elevation of the pediment; thus giving to the portico the preponderance in favor of height and vertical character, whilst the flank decidedly assumes a horizontal one.

That the general effect of the linear arrangement of the Grecian Temples, when

seen in perspective, should be horizontal, is very obvious: its general form and greatest masses are in proportions, lying in a horizontal position—the roof, the entablature, the aggregate of the columns, the base, and, in this case, the pediment, all concur in declaring the principle of its linear arrangements to be so, (see fig. 1, plate 4, of illustrations); and thus viewed, the portico, uniting with the flank, increases that effect, (see fig. 2,) although it possesses in itself the principles of another quality. These great and leading features all conform to the same end, and have proportions relatively agreeable to each other, without reference to the subdivisions that take place within their respective quantities.

It thus appears, that in the composition of the Temple, the arrangement and relative proportion of the masses was an early and chief study. The imposing mass, effected by the aggregate of columns, was placed as if it were the body of the building, to which all others was assistant or subordinate.

As the prevailing masses below and above the columns were of such a character as to seem to bind or girth the whole edifice, the secondary or vertical lines and proportions, as the triglyphs, mutules &c., submitted as readily to their influence; and, by their judicious use, they obviate the monotony, if it may be so called, of the frequently repeated horizontal lines. It seems to have been a principle with the Architects of the edifices, that all the chief masses should be horizontal, and the subordinate masses vertical, excepting such as partake of a diagonal character, and which merit distinct consideration; also that the leading lines should have, or have the effect of, undisturbed continuity, whilst the secondary lines should be as decidedly, and sometimes even abruptly intercepted.

In the vertical subdivisions of the masses forming the columns, the triglyphs, the metopes, and the mutules, and even the ornaments above them—the acroteria and terminations of the roof—it is evident that great attention was paid to produce the effect of altitude by conducting the eye from the base upwards along the columns and entablature, in a succession of lines admirably proportioned to each other, and becoming shorter as they approach the summit of the building. Thus the simplicity of the base is not interrupted by longitudinal subdivision; the columns spring from it fluted* and without bases, and form contrasts, the most decided and abrupt, to the horizontal planes on which they stand; thus the eye is necessarily directed upwards—it is pained by an attempt to descend: the diminution of the column assists in leading the eye gently on, and the neck of the pillar, joining in an easy and almost continuous curve with the echinus, is not interrupted until it has passed the abacus which crowns its capital. The triglyph, with the guttæ and mutules, take up the vertical lines, and produce great variety by their forms and quantities; and these lines are still carried on by the enrichments that adorn the termination of the cornice. Thus the eye is irresistibly led upwards through the whole composition.

The diagonals, or third variety of lines employed in the composition of the Grecian Temple, are few in number, chiefly consisting of those formed by the inclined lines of the roof and pediment, by the echinus of the capital, and lastly, by the sloping of the mutules, corresponding as they do with the lines of the roof. But, although these in reality are very few, they are rendered sufficient by an effect equivalent to diagonal inclinations, produced by the laws of perspective, in whatever situation the edifice may be viewed, and which reconciles the vertical with the horizontal effect, by softening the character, which lines, directly opposing each other, necessarily produce.

In addition to this source of diagonal lines, there exists another, which creates them, and by which the Greek Temple is admirably designed to benefit: these are the sloping and curved forms of shadows projected on the several surfaces, imparting a richness, as they seem to revel amongst the flutings of the pillars, that surprises and delights the observer, and qualifies the otherwise simple forms to harmonize with the sculpture in the building.

On a first view of a Temple, the mind is engrossed by the edifice, as a magnificent whole; on the second, by the relation and harmony of its parts; and at length by the richness produced by its sculpture and its shadows.

But in Greece, design in Architecture was, probably, not limited to the management of the severe details of the art; its ornamental features, which are now considered to belong almost exclusively to the sculptor, appear to have been identified with the duties of the Architect, so far, at least, as relates to their peculiar characteristics and arrangements; and to those points he must have devoted considerable attention. This is evident in the existing remains of the Greek Temples, wherein the sculpture so admirably conforms to the principles which govern the general design, as scarcely to leave a doubt that it is attributable to the same taste and genius, and that it received an equal portion of deep study. The forms of the sculptured embellishments, being as important to the perfection of the design as any other part of the edifice, are accordingly found to be disposed with the most scrupulous attention towards creating that harmonious effect which is so much admired.

The sculpture in the Greek Temples appears to be of three distinct characters; that of the pediment, that of the metopes, and that of the bassi relievi which decorate the peristyles, as relates both to their lineal composition and to their relief. The composition of the pediment was undoubtedly conformable to its peculiar shape, arranged so as to harmonize with its sloping and overhanging cornices, and so grouped together in a well balanced mass, as to appear a subject worthy the support of the dignified columnar strength beneath it. These figures being entire statues placed in front of the tympanum, produced an effective depth of shadow, well calculated to associate with the solemn recesses of the portico, and without which the tympanum would seem to be but an ornamented wall, too cumbrous for its situation; a defect visible in every pedimented portico that is permitted to be plain or ornamented less independently of relief, (see fig. 3 and 4, plate 4, order of Temples.) In the metopes, this quality of agreement with the surrounding frame is wholly abandoned, and angular or crossing figures are adopted, which do not repeat the upright lines formed by the channels of the triglyphs, but admirably separate them from each other, (see fig 5, plate 4, of illustrations); hence the subjects of the metopes consist chiefly of conflicts between combatants, and which admit of the attitudes necessary for the purpose. In the Roman order, a similar principle of decoration was pursued, and crossing implements of sacrifice were introduced, varied by paterae, (for the circle is equally separating,) or other suitable devices corresponding with the purpose to which the building was dedicated.

From the peculiar and high relief in which the metopes of the best examples were executed, they most advantageously intercepted the bold shadow projected by the cornice upon its broken surface with an enriching and undulating edge, thus preventing it from appearing to divide the entablature, which it otherwise would do, into nearly equal portions, a little below the middle of the frieze; a situation in which the semblance of a division would be most injurious, as it would disturb that effect of harmony in the relative proportions of the entablature so conspicuous in the Greek examples. The triglyphs themselves are intended to produce this undulating edge of shadow in a degree, and the mutules assist in continuing it; but these being insufficient, and the object so beautifully obtained by metopes, when judiciously executed, no experienced eye can be satisfied without them, nor will the connoisseur deem that a just copy of the Doric entablature in which sculptured metopes are not to be found; for, when omitted, that important principle in Architecture becomes violated, which prevents the projected shadows from disturbing the adjusted proportions—a defect which would otherwise occur in the present instance, in one of the leading features of the composition, and in a place of all others, where it is most to reprehended.

The bassi relievi of the peristyle, although in shade, and placed at a great height, are most useful to the effect of the building; circumstances assuredly the result of mature reflection; for so situated and so delicately marked, they enrich the broad shadow by their varied forms and softly reflected lights, without competing with the enriched entablature and fluted columns, which, contrasted with their repose, seem thence, in the atmosphere of Greece, to glitter with augmented brilliancy.

Upon reviewing all these points in which it appears that sculpture as an accessory is needful to the perfection of the Greek Temple, it is obvious when, in a modern building, intended to exhibit its beauties or imitate its excellencies, sculpture is omitted, the result will be offensive to the taste, the whole will appear neglected, the pediment, if there be one, heavy and obtrusive, the entablature disproportioned and the walls bare; thus the uninformed spectator will retire from it without regret; and the connoisseur will feel that none of its qualities are perfected; the absence of the intermediate and reconciling as well as the embellishing agent is manifest to him, and he views the whole as an unfinished edifice, whilst he deplores that its merits and capabilities of receiving the advantages of sculpture are so neglected.

That the Architects of Greece were not content with mere mathematical precision in the composition of their works, is evident from the deep attention paid to the parts in which a neglect of this might have been deemed excusable. The leading deviation from this precision is exhibited in the difference of intercolumniation at the extremity of the Doric portico, a practice not imitated by the Roman architects, but one that obviates the objection which is justly made to the appearance of weakness at the extreme ends of the portico or colonnade, when the precaution is not resorted to. Notwithstanding the extent of this remedy, they pursued it still further, for observing that all bodies when viewed so as to be immediately opposed to space, appear to be less than those seen in connection with other substances, they also increased the diameter of the extreme columns, (see Fig. 6, Plate 4 of Illustrations,) so perfectly in proportion to the optical effect, that the deviation was only discovered by careful measurement. Even here these intelligent and reflecting artists were not content, but overcame another defect in columns arising from a similar cause, when they are formed so as to diminish regularly from the lower to the upper diameter: in this case the column is well known to have a thinner appearance in the middle than such a diminution would be supposed to produce; this defect they however avoided by the entasis or swelling of the column, employed in a degree so exactly suited to the purpose, that until lately the entasis in the best examples of the Greek Doric column was not even suspected.

In the design of the entablature, they were no less careful to satisfy the correct eye; for after having adjusted its magnitude, it appears that they were careful that the epistylium, or architrave, should be in appearance adequate to sustain the weight assumed to be placed upon it by the triglyphs: the height of this portion of the entablature is therefore great when compared with sizes needful for strength merely, had it been executed in timber, as in the early Tuscan temples, or with the examples of the Roman Doric order, the architrave of which is not of sufficient substance to satisfy the mind that it is capable of giving ample support to the parts above it. The massiveness and simplicity of this feature derives additional force from association with the facia of the cornice; they are admirably proportioned, and aid each other in the contrasting duties assigned to them, as well in respect to shadow as to the sculptured embellishments. Indeed it appears on an intimate study of the works of the Greek architects, that the principles which governed the linear arrangement, and that of the shadows, were the same in both, being powerful contrasts opposed to each other, and reconciled by the intervention of a medium capable of preventing the discord that would necessarily occur without it. This in the linear department, is the diagonal line, formed by the mouldings wherever they are found, and in the shadows, by the reflected lights that occur upon the face of them. In considering the profiles of the Greek and Roman Doric order, there seems to be a distinguishing characteristic in each, arising from a difference of proportion in the adjustment of the diagonal lines, (*See Fig. 7, plate 4 of Illustrations,*) and consequently of the middle tints as relates to the shadows; in the former, the diagonal forms being comparatively small, and in the latter, often of quantities surpassing the horizontal and vertical lines connected by them: the effect produced by this arrangement alone, enables the connoisseur, even at a great distance, to declare the order of the building.

This brevity of diagonal or moulding in the Greek arrangement, followed by a proportionate limitation of middle tints, required that its quantity should not be lessened by the shadows that occur when the face is undulating, as in the cimarecta, or in the ogee: the diagonal line was therefore generally preserved, and the form termed an ovolo, resulted from it. In the profiles of the Roman Doric, the diagonals being of considerable length, the middle tint would have prevailed over the lights and shadows in an objectionable degree, if it had not been subdi-

* That the flutings of the columns, numerous as they are, effectually aid this intention, is obvious, as well as that they enrich the columns, and render them suitable to the sculptured entablature; but the flutings are in other respects essential to the perfection of the design. The repetition of the lines on the surface of the columns prevents them from appearing, under any point of view, as masses too large for the dignity of the whole; and when viewed in perspective, by being thus infinitely multiplied, the appearance of unity is obtained, just as in engraving, the effect of a uniform mass is produced by an accumulation of parallel lines.—*See prospective view in plate 4, of Illustrations.*

vided and broken by the alternate shades and reflected lights which the quick undulating surfaces, and many filletings produce. Upon principles resulting from this circumstance the mouldings of the two orders are formed.

On comparing the profiles of the Greek with the Roman Doric order, it appears that the latter is composed of smaller parts than the former, and that in the minutiæ it is more complicated; the consequence is, that the shadows projected are also less simple than those of the Grecks; they endeavored to preserve masses of what the painters term "middle tint," broad quantities of light, relieved by striking depths of shadow and sparkling effects, for which the forms of the mouldings were carefully designed, and for this purpose these were usually generated by the ellipsis, the parabola, or hyperbola; but the mouldings of the Roman orders are almost invariably composed of cireles, either simple or compounded, in equal portions from equal radii. This produced similar quantities of middle tint, light, and shadow. The Greeks carefully avoided this sameness, and judiciously and tastefully made the shadows to prevail distinctly; hence, in all their works we find the result of a superior understanding of the principles and effects of the light and shade, which are opposed to each other, and relieved with great skill; whereas, in the Roman style, being divided and broken, they are certainly less beautiful and less capable of affording the charms of reflecting light than the vestiges of Grecian art, which, by their well studied proportions, merit respect and imitation.

As the prineiples which direct the forms of the mouldings, and the arrangement of their light and shadow, are the same as those which govern the sculpture, and as they correspond with those forms and effects which we behold in the museular action of the human figure,—it may be presumed that the ancient architects were intimately acqnainted with the principles of the art of sculpture, if they were not always the immediate agents who produced the celebrated works that adorned their Temples. Be this as it may, there can be little doubt that the perfection to which both arrived, resulted from contemplation, and careful study of whatever was deemed suitable in nature, and particularly of that on the characteristics of which the work of art was to be founded. Principles of art may be deduced by study from whatever is most beautiful in nature, and transferred into arrangements that shall preserve its character without reminding us too forcibly of the source whence they were obtained.

In the Ionic and Corinthian examples of the Grecian orders, the result of similar observations and study is decidedly manifest, and the student in architecture will do well to revert to the same sources, to study with assiduity the perfeetions of nature, and thus qualify himself to impart those inherent principles of beauty to all his works.

As neither the Greek nor the Roman architects were negligent of the beauties of vegetable nature, their edifices abounded with imitations of them, so admirably adapted to the purposes to which they were applied, that they are viewed by the artist, not as copies, but as original inventions. The Grecks, who studied relativeness of form with the greatest care, adopted, as prototypes, for such ornaments, those ligneous plants which best permitted an arrangement of graceful lines, and which they could use as a medium for combining, as it were, one part of the design with another, or for leading the eye of the spectator by the course most advantageous to the general design. In the sculpture of these, they observed the same principle of relief, and of light and shade, as where the human figure was employed. In this species of ornament, among the Greeks, the stem usually prevailed over the quantity of foliage; whereas, in the Roman decorations the stem was made subservient to its luxuriance; and the Roman examples prove how capable those artists were to use these means of decoration most amply, without seeming to overcharge the orders in which they were adopted.

The artist of both countries employed the circular forms of the flowers for the same purposes, that of separating one part of the design from the other (see Fig. 8, Plate 4, of Illustrations), as observed of the metopes, and of attracting the eye of the speetator to suitable points of repose, where, from a multiplicity of angles, a sort of confusion would otherwise occur, as in the eoffers of empannelled buildings, or in the soffits between the modillions of the Corinthian and Composite orders (see Fig. 9, Plate 4. of Illustrations); and in these flowers, the diagonal lines are frequently manifested, obviously for the purpose of a better reconcilement of the parts. Thus, in all the features of the most perfect edifices it will be seen that certain principles of design have been kept in view; that conformity of the parts to the whole, and relativeness to each other, were combined with elegance and grace; that the changes incident to the laws of perspeetive were consulted in the design; and that the operations of light and the effects of shadow were no less studied and systematically arranged by the great artist, both of Greece and Rome; and there can be no doubt that, in their admirable works, they sought to avail themselves of such materials for building as werc capable of displaying with the greatest advantage the results of their studies; and that they considered brightness of tint and smoothness of surface essential to those objects, and employed them as the means of augmenting the beauties which could not be effected with coarser materials. However admirably the Greek temples were designed, both in form and in proportions, and however judiciously prepared to require force of effect by well-arranged opposition of light and shade, even under the favorable circumstance of the brilliant illumination and the clear atmosphere of Greece, such exquisitely white materials as the marble in which they were executed, was necessary to the perfection of the chiaroscuro of the composition; for without enquiring if whiteness and polish be sources of abstract beauty, it is evident that the Greek architects must have failed to obtain the perfect results after which they were so arduously seeking, if they had been obliged to employ a dark or eoarser material. They assuredly eonsidered the bright complexion of the stone as applicable to their intention, just as the painter does the white color on his pallette, and thence arranged the forms, to obtain striking and pictorial effects of light, modifications of tint, and depth of shade, whieh it would have been impossible to aequire, with similar effect, by a dull material. The chaste and bright hue of these buildings, when entire, and illuminated by a mid-day sun, having the force of this brilliancy increased by eontrast with their solemn shadows, must have inspired an admiration which cannot be adequately produced by the same arrangements of detail in colder regions, and where the eomplexion of the stone is not favorable to the purpose. These circumstances should receive full consideration from the arehiteetural student, who will thence, perhaps, on this, as well as on many other accounts, see how ineffectual is mere plagiarism towards inspiring a similar sentiment, and learn to imitate the judicious horticulturist, who fully eonsiders the consequences of transplanting a tree from its congenial soil and climate to another unsuited to support the perfection of its nature. Indeed, the young architect who seeks the principles of his art, and studies at the same sources from which they were obtained by the ancient masters, will not only find his course directed and his labours lightened by the examples which are yet open to his observation; but, if he be capable of duly appreciating the excellence of their works, and the principles on which they were produeed, he will abstain from the too common practice of selecting parts from various works, and of combining them, to make new designs; scorning the easy process of mere plagiarism, he will think for himself, and endeavour to rescue the art he pursues, from the aspersions that are too often and too freely east upon it by those uninformed of its merits or its powers.

It is evident, from the great size of some of their temples, that the Greeks admitted the cireumstanee of magnitude to be a source of dignity in architecture, seeing that however small the cell was required to be, the contour was occasionally increased to magnificence by its portico and peristyles, as appears in the plans of temples, (see plate 4.) and from the testimony of Vitruvius and other writers. But, however fully impressed with the importance of magnitude towards creating notions of sublimity, they seem to have imposed such limits to the size of their temples as rendered them eapable of being embraced at one view by the eye of the spectator, when situated at so inconsiderable a distance that their component parts could be suffieiently distinguished and admired; as if they feared to present a cause for comparison, on the single account of vastness, with other and larger works, or with the stupendous productions of nature around them. Had the Greek artist sought to impress the mind chiefly by sueh means, they would surely have made the approach to the temple on the side, that so they might have presented the greatest quantity of the building to the eye of the persons who approached it. As they selected the end of the edifice for this purpose, it may be presumed that the effect of magnitude was considered by them to be of secondary importance. This circumstance, and the perspicuity evident in all their designs, seem to prove that those architects were anxious to impress the spectator, at one and the same time, with the greatest force of which the work was capable, and to prevent this from being weakened by speculations arising from intrieate forms, or doubtful extent, at a moment when they desired to engage the understanding by qualities of refinement worthy of the edifice, more rare, and less easy of attainment; and also that they sought to inspire the spectator with sentiments of admiration for their sacred buildings by means more adequate to exhibit the powers of intellect, when directed to such objects, by manifesting the infinite superiority of the energies of the mind over the operations of mere labour.

On an examination of the vestiges of the best Grecian architecture, it will be obvious that the artists were less anxious to introduce novelties than to perfect certain effects that had already obtained the approbation of the judicious, as well as to remove those appearances of imperfection which arise from optical or other causes, even at the expense of mathematical accuracy; and hence the little difference exhibited in the detail of the Order as represented in (plates 5 and 6,) the profiles of those of the Temple of Theseus and of the Parthenon, wherein the parts are curiously corresponding, but which are, perhaps, most perfect, in the latter example; but towards accuracy in their conclusion, it is proper to consider the relative magnitude of these buildings, the column of the Parthenon being nearly twice the diameter of that of the Temple of Theseus; and it is quite possible that so considered, each may be perfect in its proportions and detail.

Towards an analysis of the Doric Order, and the means of exhibiting the steps of its progressive improvement up to the period of its decline, it would be of great advantage if the dates of the various buildings were correctly ascertained, as it would thence be easy to deduce what the Greeks considered improvements of the Order; and this information would guard the modern architect against retrograding in his art, or, if he must implicitly adopt, at least prevent him from disgracefully selecting an inferior example, when one more perfect was before him.—An ingenious writer has endeavoured to supply this deficiency in the history of the Doric style of art, by conclusions drawn from the vestiges themselves, unaccompanied, as they chiefly are, by adequate record or inscriptions, and gives priority of date to those of the most massive proportions; and it is probable, that such proportion would have been adopted in imitation of those already prevailing in the massive pillars of Egyptian and other eastern edifices and excavations, although they were applied to works in which the principles of a lighter character were taken as the model for the arrangements and their parts.

With a view to exhibit the relative proportions of several examples of antiquity, the following Table is introduced, the scale being a division into sixty parts of the lower diameter of each column.

PROPORTIONS OF THE DORIC ORDER.

	Height of Column.	Top Diameter.	Architrave.	Frieze.	Cornice.	Intercolumniation.
	D. M.	M.	M.	M.	M.	D. M.
Temple of Corinth,	4 4	44 2-3	48 2-3			1 14
Hypæthral Temple at Pæstum,	4 8	41 1-4	42 1-3	40 1-2	21 1-2	1 4 3-4
Temple of Selinus,	4 21 3-4	46	46 1-3	44 2-3		1 2 1-3
Temple of Minerva at Syracuse,	4 24 1-2	46	44 1-2	40		1 5 2-3
Pseudo-dipteral Temple at Pæstum,	4 27	40 1-3	50			59 1-2 & 67 2-3
Temple of Jupiter at Selinus,	4 34 1-3	35 1-2	52	44 2-3	26	
Temple of Juno Lucina,	4 42	45 1-3	55	45		1 15
Temple of Concord,	4 45 1-4	46	46 4-5	46 1-3	25	1 10 2-3
Hexastyle Temple at Pæstum,	4 47 3-4	43	45 3-4	44 3-4	24 3-4	1 1 1-3
Temple of Jupiter Panhellineus,	5 24	44 1-2	51 1-3	51 1-2		1 41
Temple of Minerva at Athens,	5 33 1-2	47	43	43	32	1 17 2-3
Temple of Theseus,	5 42 1-3	46 2-3	50	49 1-2		1 37 1-2
Temple of Minerva at Sunium,	5 54	45 3-4	48 1-2	48 1-2		1 28
Portico of the Agora at Athens,	6 2 1-2	47	40	42	21	
Temple of Apollo,	6 3 3-4	42 1-2	49 2-3	42 1-2		
Temple of Jupiter Nemæus,	6 31	49	38 2-3	43 1-2		
Portico of Philip,	6 32 1-2	49 1-2	38 1-2	43 3-4	25 1-2	2 43 2-3
Theatre of Marcellus,	7 51 2-3	48	30	45 5-9	37 2-9	

Certainly the severe features of the Doric Order afford better means than the Ionic or Corinthian examples, wherein to trace the principles of design, particularly in Grecian architecture, and to teach the mode by which those architects proceeded and eventually arrived at excellence; but it is necessary for the student carefully to investigate the peculiarities of the latter orders, and to trace the principles upon which they were founded. The peculiarities referred to are chiefly those which give to the Orders new characteristics; and although the Grecian artists did not so cherish them as to afford many examples, and these have been greatly diminished, yet such of the Ionic Order as we have received from them, being designed with the same judgment, and being doubtless the result of similar study, exhibit what was perhaps esteemed by them as perfecting their intentions, a knowledge of which is a proper object of a student's inquiry.

If, as it is recorded by Vitruvius, the ancient architects sought in the beauties of the female form and proportions the types of imitation for the beauty and gracefulness of these latter Orders, they have well expressed a semblance characteristic of those excellencies, in spite of principles necessary to construction, and amidst the elements of strength and durability. The qualities that seem naturally to appertain to building are those that we identify as masculine, such as strength, firmness, and capability of resistance, and therefore congenial with the Doric Order, for which reason of conformity and suitableness the Greeks probably preferred it; but that the difficulty should be so overcome, as we find it is by the examples of the Ionic and Corinthian Orders of the Greeks, is a matter of admiration; for we there find identified with the qualities of strength the feminine delicacy which we admire in the lovly forms whence those characteristics originated.

The union of those properties of strength and beauty being satisfactorily accomplished in the Ionic Order, it became much more practicable in the hands of the architect than the Doric could be, controlled as it is by the ordinances of its triglyphs and the severity of its intercolumniations; and it is very probable that it was used for general purposes, as well for temples dedicated to public worship as subsequently in buildings similar to the aqueduct of Hadrian, as it is called by Wheler and Spon. The descriptions of the Ionic temples of Greece, as given to us by early writers, and by several praise worthy travellers and authors who have investigated their remains, induce us to infer that the Order was not usually applied to buildings of considerable magnitude. The temples on the Illyssus and of Erectheus and Minerva Polias, afford the most esteemed examples of the Order, but suffer the disadvantage of not exhibiting those sculptures or metalic embellishments which are essential to the perfection of the buildings, which it is believed they formerly possessed, and which they would require to an extent at least as ample as was afforded to the Doric temples.

Although it is to be regretted that Vitruvius and other early writers have not transmitted much information on the principles which in Greece governed the erection of its Ionic edifices, still we may rejoice that so much remains yet of Athens, both abroad and at home, for our investigation, that we are in part enabled to supply the deficiency; for those venerable fragments of ancient art, however mutilated by time, ignorance, and barbarism, beautiful even in their decay, show that this style of art had there arrived at an excellence which probably was never surpassed in any other portions of Greece, notwithstanding its high reputation in Ionia, and the extolled and magnificent works at Ephesus and Miletus.

From these remains it may be inferred that the Ionic style was applied by the architects of Athens to small buildings chiefly, and probably to such as were dedicated to youthful or female divinities, and to the inferior order of mysteries; and whatever may have been the type on which its character was founded, it is evident, that its proportions and arrangements are rather suited to please, on account of its grace and richness, than to awaken the sublimer sentiments to which the Doric Order is so admirably and peculiarly addressed. Thus as the mind readily associates ideas of beauty with that which is comparatively little, and the idea of smallness with that which is lovely; a principle, in addition to that of suitableness to its appropriation, may be deduced, by which those artists designed the sacred edifices in question; for it is probable that, when, from want of magnitude in the edifice itself, they could not produce the effect of grandeur, they judiciously aimed to substitute a character of elegance and beauty.

Some erroneous notions appear to have arisen respecting the embellishment of the Ionic Order, on account of the plainness which appears in some of the fragments themselves, and in the representations of the several edifices, as given by Stuart and others; but although the little temple on the Illyssus, since destroyed, did not exhibit sculpture in the moulded detail, there is no doubt, from the then existing appearances, that the frieze was decorated by sculpture, and that the tympanum of the pediment was equally adorned. The almost profuse embellishments of the capitals and mouldings of the Temple of Erectheun, and portico of Minerva Polias, proves that richness was a part of the character of the Order, (see plate 13) and as it was sometimes the practice of the Greeks to adorn unsculptured surfaces by fresco and other painting, and as the architrave in the pronaos or porch of the Temple on the Illyssus retained to the last a considerable portion of painted ornament on its surface, it is improbable that its more visible parts were deficient in due proportion of embellishment.

With regard to the Order as exhibited in the remains of the Erectheum and portico of Minerva Polias, the lesser parts being exquisitely enriched, it is not reasonable to suppose that the whole would have been so incongruous as it must have been, had the cymatium, frieze, and tympanum been destitute of ornament; and the marks on the frieze, which show the places that in all probability formerly received the means of fixing sculpture or metal relievi, demonstrate that part, at least, to have corresponded with the perfect remains of the edifices.

The absence of such marks, if they are not to be found in the frieze of the portico of Minerva Polias, is no proof that the perfection of the Order did not require sculpture in that part, because it might have been there omitted, on account of its being situated to the northward, consequently in an aspect unsuited to display, and so near to the declivity of the Acropolis, that it could not have been adequately viewed.

In both examples the subdivision of the epistylium increases the demand for sculpture in the frieze, and its upper moulding is made to project by it so far as to form an ample recess for the sculpture that seems to have been applied to the surfaces above it.

But for the free use of embellishment to this Order, the secondary parts themselves are too few and simple, and perhaps too ample for the necessary expression of delicacy, whence the Order has been termed imperfect; but, being sculptured, they are certainly the better suited to the object; for it should be considered that when delicate ornaments are sculptured in such quantities, the very circumstanees of their breadth and simplicity augments the richness applied to them.

In all cases, the best examples shew that the mouldings intended to be plain should be more subdivided and irregular in their outlines than those that are to be sculptured. Painters are aware that youthful and feminine beauty depends on proportions illustrative of the principles producing interesting contrast; the distinguishing features of a child lose their infantine loveliness as they become large, in proportion to the other parts of the countenance, and the reverse of this Order is acknowledged to be incompatible with female beauty. These facts, in addition to the claims which the Ionic Order has in common with the Doric, lead us to infer that the entablature and pediment of the Ionic Order of Athens was amply embellished, and besides, it is evident, that without the presence of the sculpture alluded to, the capitals of the columns and the embellishments of the inferior parts of the edifice would be out of harmony, nor is it reasonable to suppose that the finishings of those parts that are lost to us from the devastatiens of time and other causes of destruction, were less corresponding with the subject than we find those to be, which so happily for architecture, are subject to our examination.

The capital of the Ionic column may be considered as the scale of embellishment to the whole Order; for, so far as can be deduced from existing documents, the other parts of the work are in complete harmony with it, whether they be compared in the simply elegant temple on the Illyssus, or in the abundantly decorated Erectheum, or temple of Minerva Polias.

Although the revival of genuine architecture in Europe and America is so eminently indebted to Greece for instruction in the Doric and Ionic, it must remain a source of deep regret, with respect to the Athenian practice in large works of the Corinthian Order, that time has forever thrown over it an impenetrable veil; for although the Temple of Jupiter Olympius, if properly so called and correctly copied, is in this style of art yet, its remains are mutilated and few, but in magnitude and proportion such as to assert a claim to the reputation, as recorded by Vitruvius, of being "universally esteemed and accounted one of the rarest specimens of magnificence," and paralleled with the celebrated Doric Temple of Ceres and Proserpine, at Eleusis, and also with the Ionic temples of Diana at Ephesus, and of Apollo at Militus.

The Corinthian Order in the little monument of Lysicrates cannot but be admired for its elegance and beauty, but it is evidently not suited in its proportions and detail to works of magnificence: it may be esteemed a variety of the genuine or-

der, as practised by the Greeks, applied with exquisite taste and feeling to an edifice in which the quality of grandeur was not attempted. But this interesting little work of art, by its own arrangement, teaches that the same dispositions occurred in this order as in the Doric,—solid support in the basement, in the middle a bold relief of light and shade, and in the upper part a display of enrichment and a decorative lightness; altogether not unaptly compared with the progressive variety in a tree, from its firm base at the earth in which it grows, to the lightness of its terminating leafage.

Whether those artists sought in nature the principles of art or not, it is certainly true that in architecture, the works most esteemed are those that are also most conformable to the laws of nature; and they are judged of through their operation, although the perception may not be aware of it; but it is, perhaps, one of the excellencies of the art, that in its imagery the type of its origin is not easily recognized.

On an examination of the architectural works of Rome, it will be found, that those examples of the Roman Orders are most esteemed which are composed upon principles of design that approximate nearest to those employed by the Greek architects, particularly as relates to proportion, contour, and expression, and whether it be in the Doric, or in the Ionic Orders. The Greek entablature is so proportioned, that the epistylium and frieze exceeds considerably in length the diagonal of the cornice, by which it acquires the appearance of ample strength, and affords space for the broad shadow, projected from the facia; whereas the Roman entablature is sometimes so composed, that the frieze and architrave are of much less extent than the diagonal alluded to; from which circumstance the cornice appears too large, and the whole entablature acquires the effect of being heavy without the benefit of appearing strong; and from the want of force in the shadow projected from the facia, conspicuous in the Greek examples an equally effective relief is not obtained.

Even in the most approved remains of the Corinthian Order—an Order decidedly preferred by the Roman architects—there is a defect of contour in the cornice itself, attended with that disturbed imperfect shadow of its members which has been before referred to; for the projection of this cornice being nearly the same as its height, and the parts of the profile made to correspond with the inclination of a diagonal line, drawn from its projection to its base, the whole cornice becomes inharmonious and broken in its light and shade, so soon as the sun approaches to an elevation by which his rays descend parallel with its direction, even on the fronts of edifices directly opposed to his influence; soon after, all its members are veiled in shadow, and depend on reflected lights for relief, unless indeed, the facia is so arranged as to intercept his rays. In some examples this feature is nearly or wholly absent; in others it is very limited; and even in the most approved examples—those of the temples of Jupiter Tonans, of Jupiter Stator, and the Parthenon—the magnitude and situation of the facia are not adequate to produce the contrast desired, and so admirably effected in Grecian architecture. The Forum of Minerva, the arch of Trajan and Temple of Mars Ultor, are examples wherein these defects appear conspicuously. In the Doric and Ionic Orders at least, it is known that the Greeks omitted the corona, except where the pediment required its aid, and studiously gave to the facia an importance which is essential to perfection in architectural design.

The capitals of the Roman and Grecian Ionic Order differ in the same respect of distinctness or expression; the parts of the former being mixed together and confused, whereas the latter have them separated and entire; the abacus and its volutes being placed on the echinus as independently as the abacus of the Doric. In the Corinthian capitals and foliage of Grecian examples known to us, this distinctness is always found, and particularly in the best documents, as though it were a principle on which their artist designed them, that they should have the power of interesting by their variety, without embarrassing the mind with encroachments on simplicity; and it will probably be found in all the Athenian examples, that the bases of the Orders, where they are used, are composed with similar attention to perspicuity.

In the edifices of Greece there exist a peculiarity, a degree of which is sometimes observed in the Roman practice, but which has been much neglected by the Italian masters, with respect to the bearing of the epistylium on the capital of the column, and its consequent width, and which, perhaps, has not been sufficiently noticed by writers on architecture. The soffit of the epistylium, (see plates 10—14 and 16,) in each is nearly as wide as the inferior diameter of the column, whilst in the Roman and Italian practice it is chiefly governed by the dimensions of the superior diameter, being made of the same width. From this circumstance, it is probable that their capitals are less bold than those of the Athenian works; and to obtain a proper arrangement of triglyphs and modillions, they have been compelled to resort to the projection of the facia of the epistylium to extend the frieze; thus to assist the lower portion of the cornice, without which those embellishments could not be separated so as to suit the intercolumniation desired; for these must in all cases, be relatively adapted to each other.

The practice of the Greeks and Romans in these particulars differed so much that they may perhaps afford the means by which, in a critical examination where doubt exists, the works of one country may be satisfactorily distinguished from the other. With regard to the connection of the transverse soffits of the epistylium with the walls of the Grecian Temples opposite to the antæ, as the latter are of a similar width, and do not profess to be imitations of the columns, no difficulty occurs; but in the Roman practice, square pillars, in proportions and decorations corresponding with the columns, are made to receive the soffits, it has been difficult to follow the proceedings of the Greeks in the desirable increase of the soffits in question, because it would require that the pilasters behind the columns should not diminish, as was usual in the Order, or that the soffit should overhang the pilasters, which is always offensive to the eye.

The principles alluded to in all the foregoing observations are applicable throughout the vast field of regular architecture, to which the want or desires of mankind may require its aid; unless they were so, the student would uselessly seek amongst the ruins of Greece and Rome for the practices followed in their designs; but if they are rightly understood, and judiciously applied, to the church, the palace, the theatre, or the humbler private dwelling, according to their respective demands, whatever they may be, of sublimity, splendour, magnitude, beauty, or accommodation, or whatever changes the local circumstances of climate or habit may require, they will adorn his exertions. Still the architect must for himself supply by study and reflection—the same means by which the ancients acquired their well earned reputation—the demands made on his ingenuity and judgment; for it would be absurd to suppose that these can be supplied by a mere copying of works, prepared for, and suitable to, partial purposes only, amidst other habits, and in other climates.

As examples of the powers of the mind, and the readiness with which the principles of ancient art have been made to apply to other and widely differing purposes, the works of the Italian architects are eminently encouraging; in the noble and splendid buildings of Italy they may be unquestionably traced, and each is amenable to the test of similar criticism, as all afford proper subjects for the contemplation of the student. In its unquestionable unity will be found the source of dignity in the palace, notwithstanding the variety of its form. Its continued terraces provide a secure and extended base, from which, like the columns of the Greek or Roman temple, arises its aspiring arcades, pillars and towers, bound together by its architraves and cornices, above which the sky is met in parts of less magnitude, but equally enriching, formed by its domes, turrets, balustrades, vases and figures, altogether combined in the greatness of relative proportions, of simplicity and ornament, rendered the more striking by its well disposed light and shadow, and the brilliancy of the material of which the edifice is constructed.

Thus in works that could not have been accomplished by mere imitation, we recognize the principles of ancient art in their designs, even at distances in which form and contour only are discernible. These works are not copies; they merit the reputation of originality; for, although in fact they are the offspring of the same art, and governed by similar laws of design, the Grecian temple and the Italian palace are as unlike to each other, as are the Greek and Roman temples themselves to their Egyptian and Assyrian precursors, and from which their origin may probably be traced, and even beyond them, to the rude excavations of yet earlier times.

*Chambers** seems to have preferred the profiles of Vignole,† Palladio‡ and Scammozzi,‖ whose works, more than any other of the Italian masters, approach the peculiarities of Athenian or Greek architecture, as they also correspond with the best remaining examples of Roman art in the Theatre of Marcellus, in the Temple of Fortuna Virilis, and in the Corinthian order of the Pantheon and the Temples of Jupiter Stator, and of Jupiter Tondans, as also of the beautiful Temple at Tivoli, probably erected in the time of the emperor Augustus. In the Tuscan order he avowedly employs the proportions as given by Vignole, and the cornice of Scammozzi. Compared with masculine firmness of the Grecian Doric, this order is feeble and ineffective, perhaps arising from the insufficient height of the entablature; but this would be less obvious if the order were affixed to the walls of an edifice, as was usual in Italian buildings. The diagonal of the cornice being a line drawn from the top of the cornice to its connexion with the frieze, is four minutes less than the collective heights of the frieze and architrave.

Chambers has also followed Vignole in the Doric order, in preference to other Italian masters, avoiding, however, the errors into which some speculations on relative harmony had seduced him. The diagonal of the cornice is two minutes and a half less than the height of the architrave and frieze. The example given from the Theatre of Marcellus is two minutes less; and that by Palladio, from the Basilica at Vicenza is six minutes less. In the Grecian Doric of the Temple of Minerva, the diagonal of the cornice, as given by Stuart, is less one module thirteen minutes, and that of the Temple of Thescus something more, in both cases the member that terminates the cornice of the pediments being omitted.

In the Ionic order of Chambers, the diagonal of the cornice is five minutes less than the heights of the entablature beneath it; whereas that of the Ilyssus, as given by Stuart, is little more than half the height of the frieze and architrave. In the Temple of Minerva Polias, the diagonal is but one third of both, and the portico of the Erectheun is the same; but this is without the upper member of the pediments, and which probably formed no part of the lateral cornice. The examples from the Villa Capra and Basilica at Vicenza have diagonals precisely corresponding with the heights of their architraves and friezes, although in both cases the projections of the cornice is very nearly the same as its height.

The Composite and Corinthian order of Chambers present diagonals six minutes less than their architraves and friezes, whilst the examples of the Composite of Palladio have both of the same dimensions.

The diagonal of the Jupiter Stator at Rome exceeds the architrave and frieze thirteen minutes and a half, and that of the Pantheon is less eight minutes. From these circumstances it will appear that the Roman and Italian orders presented a much larger appearance of cornice, as proportioned to the architrave and frieze beneath them, than was practised by the earlier architects; and as, except in the Doric order, it was usual with the former to make the height and projections of the cornice alike, so that the diagonal would be inclined at an angle of forty-five degrees; it is obvious, that in consequence of the parts deviating little from the course of this line, they would be greatly immersed in shadow except at an early and late period of the day; the cornices of the Grecian examples, on the contrary, are evidently designed to avoid this as a defect, and to prevent, at any time, a division of the shadow projected from the facia, as, perhaps, desired by the Roman and Italian architects, in the Ionic, Composite, and Corinthian orders.

* Sir William Chambers, an eminent architect, by birth a Swede, but was brought over to England at two years of age. His name will be transmitted to late posterity, as the builder of that great national ornament, Somerset Place. He died March 8th, 1796.

† James Baroggio Vignole, an eminent Italian architect. Died in 1573.

‡ Andrew Palladio, a celebrated Italian architect, of the sixteenth century. He immortalized his name by four books on architecture. He was born in 1508, and died in 1580.

‖ Vincent Scamozzi, a native of Vincenza, the most celebrated architect of his time. He wrote in Italian "Ideas on Universal Architecture," in 10 books, and died in 1616.

GRECIAN ARCHITECTURE.

EXAMPLE I. PLATE I.

ELEVATION OF A COLUMN AND ENTABLATURE, DRAWN AFTER THE GRECIAN STYLE.

On this plate I have given an example of a column and entablature, to supply the place of the Tuscan order; the mouldings are drawn after the Grecian style, which I think by many will be preferred to the Tuscan. The mouldings are but few in number, and can be left either plain or enriched, as fancy may direct. The entablaturc is in imitation of the Grecian Ionic; the cornice is taken from that beautiful Ionic temple on the river Illysus, near Athens; the mouldings have been a little enlarged, however, which I think renders them still more graceful, especially the bed moulding. The columns are divided into twenty-four flutes and fillets, and are of the elliptical form, like those of the temple on thc Illysus. The base can either be left plain or fluted after the Grecian practice, and is calculated to stand upon the step or pavement without a plinth. The capital is of Doric origin, although the proportions are somcwhat lighter.

Should it be required to execute this example to a considerable magnitude, it would perhaps be well to enlarge the abacus to ten minutes, or even to ten and a half in height, and the echinus to seven and a half or eight. The annulets are increased to a larger size than was practised by the Greeks, and are less in number. I have drawn the column eight diamcters in height, and in some cases it may be increased to ninc. The bed moulding, as drawn here, is to be carved after the Grecian practice, and the architrave after the Roman, which will give two distinct characters, and will appear much more beautiful.

The entablature is two diameters and a quarter in height. Although sóme architects consider two diameters a sufficient height for any order, yet, my own opinion is,—having practiced Grecian and Roman architecture for a number of years—that it is not a correct proportion; and I believe most admirers of Grccian architecture concur in this opinion. Let us refer to a few of the most approved examples of the three ancicnt Grecian orders. The temple of Theseus, and the Parthenon, are considered the two best examples of the Doric order now remaining. The entablature of that of Theseus is two diameters and eight minutes, according to Stuart; and that of the Parthenon is onc diameter and fifty seven minutes and a third, (Stuart) which is a little less than two diameters. Thcse two examples are the most ancient and perfect of Grecian structure now existing.

The Temple of Thescus at Athens, was built four hundred and eighty years before Christ, and is the oldest edifice now remaining in that once splended city. Athens was the cradle of the arts and sciences, and long noted for its grandeur and magnificence, but is now nearly in ruins and almost forgotten.

The entablature of the Ionic Temple on the Illysus, is two diameters three and a fourth minutes in height; and that of the Erectheon is two diameters fourteen and a half minutes in height; that from the Temple of Minerva is two diameters four minutes and six tenths; but this is without the cimarecta, or the upper member of the pediment, and which probably formed no part of the lateral cornice; and these cymatiums were of great height.

The Erectheon, and Temple of Minerva, were decorated with bcautiful sculpture, as represented in Plate 13. The entablature of the Corinthian order, taken from the monument of Lysicrates at Athens, is two diameters and seventeen minutes in height, (Stuart.)

By comparing all these examples together, their medium proportion will be about two diameters and a quarter for the height of the entablature, and which I think to be a suitable proportion.

The great superiority of the Greeks in architecture is to be traced to the same causes which occasioned their pre-eminence in almost every thing, viz. a deep investigation of the first principles, and an accurate perception of the *elements* of all that they attempted to execute. A similar investigation, and a similar perception or knowledge, and nothing short, will produce the like effects in our own country, and in our times. To the Greeks, and to them alone, let the student look for grandeur in composition, and, indeed, for all the laws of architecture, sculpture and painting.

The grand divisions of the architecture of Greece, are, first, the three styles of columns, technically termed the Orders; secondly, the several orders of Temples, or their sacred edifices; and, thirdly, the various methods of intercolumniation, or manner of regulating the distances of columns. It is these grand or primary divisions, and their due obscrvance, which entitles the architecture of the Greeks to the dignified epithet of the "*wisdom of the orders.*"

In Plate 2 and 3, arc two more examples of columns, &c. calculated only for private buildings, porticos and other small works. For some years past, the Roman school of architecture has been entirely changed for the Grecian. During the last six years there has not been a singlc example of the Tuscan order executed in this city (Hartford), and I find it to have received the same neglect in all the other cities I have visited. The expensc of executing thcse examples will be but a trifle more than that of the Tuscan, and much less than the Doric or Ionic orders; and I think they will by many be prcferred to either.

TO DRAW EXAMPLE 1 TO ANY GIVEN HEIGHT.

Rule.—Divide the height of thc column into eight equal parts, and take one of these parts for the diameter of the column, just above the base. Then as in Fig. 1, divide this diameter into twelve equal parts, and subdivide each into five parts, thc last of which divisions will be minutes, or sixtieths of the diameter. From this thc heights and projections throughout the whole order are taken. The height of each member or moulding, and the aggregate heights are expressed in minutes from this scale, by figures placed in the two marginal divisions on the platc, and the projections of thc mouldings and ornaments are likcwise expressed by figures at their extreme projections, counted from perpendiculars raised at the extremities of the superior and inferior diameters of the shaft, or from a line drawn and dotted through the base, capital, architrave and cornice, as represented in thc plate.

Should it be required to executc this examplc for a portico in front of a dwelling; the general height of the columns are from eight to eleven feet, including the base and capital.

If it is required to find the diameter of a column of the height of 9 feet 4 inches; by multiplying 9 feet 4 inches by 12, gives 112 inchcs, which divided by 8, gives 14 inches for the diameter of the column; and the entablature being two and a quarter of these diameters will be 2 feet 8 1–2 inches in height. With seven inches, or the semi-diamcter of this column, I have drawn a scale of thirty minutes on the left marginal line of the plate, and drawn all the mouldings of full size for practice. By setting the compasses on either of these full sizcd mouldings, and applying them to the scale, you will discover their proportions and the method of drawing them.

Fig. 1. The order expressed in minutes.

Fig. 2. Section through the corono cymatium and cymarecta.

TO DESCRIBE THE GRECIAN CYMARECTA.

Rule.—Divide the projection into two parts, and the height *a*, *b* into four parts; then draw a horizontal line through the centre at *c*, and, extending the compasses the distances of *a*, *b*, with one foot in *c*, set off *g*, *f*; set in *g*, and draw *c*, *e*; set in *f*, and draw *c*, *d*; then

produce the diagonal lines *g*, *e*, and *f*, *d*, and *h*, *i*, will will be the centres to complete it.

Fig. 3. Section of the bed moulding.

Fig. 4. Section of the architrave moulding.

Fig. 5. Section of the echinus and annulets of the capital.

Fig. 6. Section of the base to the columns.

EXAMPLE II. PLATE 2.

Elevation of a column and entablature drawn after the Grecian style.

The height of the column and entablature, as exhibited in this example, is the same as in Plate 1, and drawn in the same manner.

Fig. 1. The order expressed in minutes.

Fig. 2. Elevation of a cornice and plan of the soffit, which is of a different character, and can be applied to Fig. 1.

Fig. 3. Section of the architrave drawn on a large scale.

Fig. 4. Drawn for an antæ capital.

In most of my practice, I have made the breadth of the antæ equal to the breadth of the soffit of the epistylium, and given one fourth of the breadth for the projection; and in the examples of my own, given in this work, I have drawn the breadth of the soffit to the epistylum fifty-four minutes, which I consider a proper breadth for the antæs. It appears that the Greek architects were not confined to one rule. By examining the different examples of antæs throughout this work, it will be seen that the breadth is nearly the same as the soffit.

Fig. 5. Section of the base, drawn on a large scale, and calculated to stand upon the step without the plinth.

EXAMPLE III. PLATE 3.

Elevation of a column and entablature, drawn after the Grecian style, in imitation of the Choragic Monument of Thrasyllus.

I think this example will meet the approbation of most builders; and it is more generally used for porticos, frontispieces, pediments, &c. than any other of the orders. I have given seven diameters for the height of the column, and one diameter and forty-seven minutes for the height of the entablature, which is ten and a half minutes higher than the monument of Thrasyllus. If the mutules are left off, the soffit of the corono should be worked as represented by the dotted lines. The diameter of a column 9 feet and 4 inches in height, will be 16 inches. This example is drawn agreeably to the directions before given.

A. The capital of the column, on a large scale, and expressed in minutes.

B. Drawn for the antæ capital—Fig. 6, Plate 9, may be used in its stead, if preferred.

C. A column diminished after the Grecian practice.

It was formerly supposed (and I believe is still by many) that the sides of the Grecian Doric column are composed of straight lines from the lower to the upper diameter, but in the best examples they are not. Columns composed of straight lines present the appearance, as is well known, of being more slender in their middle, and this effect the Greeks avoided by the entasis, or swelling of the column, and this in a degree so admirably suited to the purpose, that, until within a few years, the entasis in the best examples of the Grecian Doric column was not even suspected. In the example here given, the column, at its upper diameter, is diminished to forty-eight minutes, being a proportion most generally approved.

TO DIMINISH THE COLUMN AFTER THE GRECIAN DORIC PRACTICE.

Rule.—Divide the shaft of the column, as in C, into four equal parts; make the first or lower division fifty-eight and a quarter minutes diameter; the second or centre division, fifty-six and a half; and the third or next upper division, fifty-two and a quarter minutes in diameter, which will give the required diminution from the lower to the upper diameter.

PLATE 4.

Illustrative of the Essay.

Fig. 1. Showing the position of the general or chief masses composing a Grecian Doric Temple, all of which tend to present a horizontal appearance, referred to in page 7.

Fig. 2. The vertical divisions of the chief masses, from which the secondary quantities and subordinate proportions are derived, referred to in page 7.

Fig. 3, 4. Elevation, showing the horizontal, vertical and diagonal divisions of the chief masses, and an ideal restoration of the sculpture in the pediments of the Grecian Temples, referred to in page 7.

Fig. 5. Is proposed to represent the crossing lines which pervade the composition of the sculptured metopes of the Parthenon, thence qualifying them to separate the triglyphs most effectively, and assisting to reconcile the vertical and horizontal lines of the entablature, referred to in page 7.

Fig. 6. Plan of an angle of the Temple of Minerva at Athens, as given by Stuart, showing the differences of diameter and intercolumniation, referred to in page 7.

Fig. 7. Showing the profiles of the Grecian and Roman cornices, referred to in page 7.

Fig. 8. Exhibits the decorations of the Roman Doric entablature, for the same purposes as Fig. 5, referred to in page 8.

Fig. 9. Showing the empannelled ceilings in the soffits between the modillions of the Corinthian and Composite orders, referred to in page 8.

Fig. 10. Showing the shaft of a column, as rising without base, from the step or pavement of the Temple; and also the manner in which the upright shaft of the column is accommodated to the horizontal position of the epistylium by means of the sloping facial line of the echinus of the capital, and the vertical subdivision of the entablature.

OF THE

GRECIAN ORDERS OF ARCHITECTURE,

AND THEIR ORIGIN.

FROM VITRUVIUS.

When Dorus the son of Helenus, and the nymph Optice, reigned over Achaia and all Peloponesus, he built in the ancient city of Argos, a Temple to Juno, which was formed by chance of this Order, and was afterwards used in the other cities of Achaia, while yet the ratio of its symmetries was not discovered.

Afterwards the Athenians, according to the responses of the Delphian Apollo, by the common consent of all Greece, sent out thirteen colonies at one time into Asia, and appointing a leader to each colony, they gave the chief command to Ion, the son of Xenthus and Creusa, whom also Apollo of Delphos acknowledged as his son. These colonies he led into Asia, seized upon the country of Caria and built the cities of Ephesus, Miletus, Myunta, (afterwards swallowed up by water and its sacred rights and privileges given by Ion to the Milesians) Priene, Samos, Jeos, Colophana, Chios, Erethro, Phocis, Clazomeno, Lebedos and Melite.

This latter, on account of the arrogance of its inhabitants, was destroyed in the war declared against it by the unanimous determination of the other states, and, instead of it, by the beneficence of king Attalus and Arsinoe, the city of Smyrna was received by the Ionians. These states, when they had driven out the Carians and Lelegæ, called their country Ionia, after their leader Ion.

There they began to erect and dedicate temples to the immortal gods, and first they built a temple to Apollo Panionios, in the manner they had seen in Achaia, and which they called Doric, because they had first seen it in the Doric states. In this temple they wished to use columns, but not knowing their symmetries and proportions, to sustain the weight and present a graceful appearance, they measured the length of the human foot, and, finding it to be a sixth part of the height of a man, they made use of this proportion for their columns, making the thickness or diameter of the shaft at the bottom, the sixth part of the height, including the capital. Thus the Doric column, having the proportions of the human body, began to be used with solidity and beauty in buildings.

Afterwards, when they were desirous of building a temple to Diana, they conceived a new species of order from a similar principle, making use of the proportions of a woman; they made the diameter of the column the eight part of its height, and that it might appear more graceful, they put mouldings around the base to represent the shoe, and volutes in the capitals resembling the twisted braids of hair dropping to the right and left, and the cymatium and encarpi for the locks disposed on the forehead; they also made flutings on the shafts from top to bottom, like the folds in the garments worn by matrons.

Thus the two species of columns were composed, one imitating the strength and simplicity of man, the other the elegance and fine proportions of woman; but posterity improving in judgment and knowledge, and aiming at still more graceful proportions, made the height of the Doric column seven diameters, and that of the Ionic eight and a half. This species was called Ionic, because it was invented by the Ionians.

The third which is called Corinthian, imitates the delicacy of virgins, for in that tender age the limbs are formed more slender, and admit of more graceful ornaments. The invention or origin of its capital is thus related:—

A Corinthian virgin, just marriageable, being seized with a disorder, died. After her interment, her nurse collected some vases which pleased her when living, and putting them into a basket, carried them to her tomb and placed them on its top; and that they might endure longer in the open air, she covered the basket with a tile. The basket happened to be placed upon the root of an achanthus, which being depressed in the middle, the leaves and stalks grew up in the spring, around the sides of the basket, but being resisted by the angles of the tile on the basket, were obliged to convolve at the extremities in the form of volutes.* At that time Callimachus, who, on account of his taste and skill in sculpture, was called by the Athenians, Catatechnos, happening to pass by this monument, observed the basket and the delicate foliage growing around it, and being pleased with the novelty of its form, he made some columns from this model, near Corinth, and composed the symetry, and distributed the proportions of the Corinthian Order in the most exqisite manner.

* Vide Plate of the primitive buildings.

DEFINITION OF THE ORDERS.

1. If any number of frustums of cones, or frustums of conoids of similar solids, and equal magnitudes with each other, be so arranged that their bases, which is the thickest ends of the frustums, may stand upon or in the same horizontal plane, and their axes in the same plane with each other, and perpendicular to the horizon, and if on the tops of these frustums be laid a continued beam, and if over this beam be laid the ends of a number of equidistant joists, the other ends being either supported in the same manner, or by a wall, or any piece of building whatever, so that the upper and under surfaces may be in the same horizontal planes, and if over the ends of these beams, be laid another beam parallel to the former, which lays upon the frustums, but projecting farther out from the axis of the columns than the vertical face of the lower beam which is over the frustums, and if this beam support the ends of rafters, whose upper surfaces lay in the same inclined plane, so as to support a covering or roof; the whole of this mass, together with the frustums supporting it, is called an order.

2. If the bottom or lower end of the frustum, finish with an assemblage of mouldings, projecting equally all round beyond the bottom of the frustum, then this assemblage is called a base.

3. If the upper end of the frustum finish with mouldings, or any kind of ornaments, and if these ornaments or mouldings be covered with a solid, whose upper and lower sides are squares, and the vertical or perpendicular sides rectangles; then this solid, together with the ornaments or mouldings under it, is called a capital.

4. If the frustum has no base, then the capital and the frustum together, is called a frustum column; but if the frustum has a base, then the base, frustum, and capital, taken together, are simply called a column.

5. The mass supported by the columns, is called an entablature.

6. The under beam of the entablature is called an architrave, or epistylium.

7. The space comprehended between the upper side of the epistylium, or architrave, and the under edge of the beam over the joists, is called the frieze, or zophorus.

8. The edge, or profile, of the inclined roof, supported by the joists, or cross beams, jetting out beyond the face of the zophorus, or frieze, is called a cornice.

9. The lowest, or thickest part of the columns, is called the diameter of the columns.

10. Half of the diameter of the columns, is called a module.

11. If a module be divided into thirty, or any other number of equal parts, then each of these parts are called minutes.

12. The shortest distance from the bottom of the frustum of one column, to the bottom of the frustum of the next column, is called the intercolumniation.

13. When the intercolumniation is one diameter and a half of a column, it is called pycnostyle, or columns thick-set.

14. When the intercolumniation has two diameters of the columns, then it is called systyle.

15. When the space between the columns is two diameters and a quarter, then the intercolumniation is called eustyle.

16 When the intercolumniation is three diameters of the columns, then it is called decastyle.

17. When the distance between the columns has four diameters of the columns, then that intercolumniation is called aræostyle, or columns thin-set.

18. When there are four columns in one row, then that number is called tetrastyle.

19. When there are six columns in one row, then it is called hexastyle.

20. When there are eight columns in one row, then it is called octastyle.

GRECIAN DORIC ORDER.

DEFINITIONS.

1. If a plane, A B C D E F G E, one side of which, A B, is a straight line, B C, and A E, at right angles to A B; and if C D be an oyolo, D, E, and F, fillets; F G, a hollow, and G E, a straight or convex curve line; so that no part of it between the points G and E, may be farther distant from A B than E is from A B; then if this plane, so constructed, be turned round the line A B, it will generate a round solid; and if a parallelopiped, the two ends of which are equal squares, each side of these squares being a little more than twice B C, and the other four sides equal rectangles; then, if this parallelopiped be fixed upon the end of the round solid, so that one of its square ends be fixed upon the end generated by B C, and the angles of the square to project equally over the round solid, then a solid so constructed is called a column.

2. The parallelopiped fixed on the top, is called an abacus.

3. The figure, or annulus, generated by the echinus D C, is called also an echinus.

4. The annuli generated by the fillets D, E, and F, are each of them called an annulet.

5. That part of the column, or the frustum, generated by the curve line G E, is called the shaft of the column.

6. If, through the axis of the shaft, be supposed to pass twenty vertical planes, making equal angles with each other, which will cut the surface of the column in twenty place; and if the surface of the column be curved or hollowed between each two lines, from the bottom to the top of the shaft, terminating immediately under the lowest annulet; then the shaft will have twenty curved sides, and as many angles; and if nearly at the upper end of the shaft be cut one or more grooves, of an equal depth from the surface of the hollowing, each groove being parallel to the annulets under the echinus, then a column so formed is called Doric.

7. That part of the column contained between the upper channel and the lower annulet, is called the hypotrachelion, neck, or frieze of the capital.

8. That part of the Doric column, comprehending the abacus, echinus, annulets, and hypotrachelion, is called a Doric capital.

9. If the ends of the cross beams in the frieze which lay upon the architrave, be at right angles to the sides of the beams, and parallel to the front of the architrave, and if the two vertical right angles of each beam, formed by the two vertical sides, and the ends be cut away by vertical planes, making equal angles with the sides and ends; that is, 135 degrees with each; and if two other vertical channels are cut on the end, so that the planes, which are three in number, left on the ends of each beam, may be equal rectangles, and the two sides of each channel make 135 degrees, with the ends of the joists, and are so disposed, that there may be a rectangle next to each semi-channel, and then two whole channels, leaving a rectangle in the middle; the end of the beam so formed is called a triglyph.

10. If the spaces between the triglyph be filled up with planes parallel to the front of the triglyphs, or to the front of the architrave; and if these planes be in the same plane with each other, and recessed beyond the ends of the triglyph, so as to show a small part of the vertical sides of the beams; that is, to be further in than the channels of the triglyph; then these spaces, so filled up, are called metopes.

11. If the front of the beam which supports the rafters that lay upon the joist, project at some distance beyond the face of the triglyph, the plane of the front being parallel to the ends of the beams; and if a recess be cut from this beam directly over the metopes, the plane of the front of the recess being parallel to, and having a small projecture over the metopes, and the ends of the recesses over the metopes be in the same plane with the vertical sides of the beam; then that part of the front of the beam over the triglyph is called the capital of the triglyph.

12. The whole face of the work comprehended between the upper edge of the beam which forms the capital of the triglyphs, and the lower end of the triglyphs and metopes, is called a Doric frieze.

13. If from the top of the architrave, project a fillet, whose upper edge is in the same plane with the top of the architrave, or the lower end of the triglyph, the front of the fillet being a vertical plane, parallel to the front of the architrave, having a small projecture beyond the front of the triglyph; this fillet being supposed to be continued the whole length of the architrave, and returning in the same manner round its ends; and if fillets be placed under this fillet, whose fronts stand a little within the front of the upper fillet, but projecting beyond the face of the architrave, and the ends of these fillets, in the same plane with the sides of the triglyph, and consequently each fillet equal in length to the breadth of the triglyph; and if under each of these fillets be fixed six equal similar frustums of cones, at equal distances from each other, whose axes are perpendicular to the horizon, and the same distance from the face of the architrave, so that the extremities of these frustums may not reach beyond the perpendicular of the ends of the fillets above them; then the front of the architrave so formed, is called a Doric architrave.

14. The upper fillet of the Doric architrave, is called a tenia.

15. The fillets under the tenia of the Doric architrave, are each of them called a regula.

16. The little conical frustums under each regula, are called guttæ or drops.

17. The plain part of the architrave under the tenia and regulæ, is called facia.

18. If over the capitals of the triglyph be laid another beam, whose front is parallel to the metopes, or to the front of the triglyphs in the frieze, having a small projecture from the front of the metopes; and if over this beam be laid the ends of the rafters which support the covering, the ends having a projecture forward and parallel to the beam under them; one rafter over each triglyph, and also one over every metope, placed directly in the middle of each; that is to say, a vertical plane perpendicular through the middle of every metope, and also through the middle of every triglyph, would pass through the ends of all the rafters, and divide them into two equal rectangles; and if over the rafters be laid a beam, the front of which, being a plane parallel to the ends of the rafters, has a projecture; and if the void spaces between each two rafters, and the under side of the beam above the rafters, and the upper side of the beam below the rafters be covered in, so that the front of the spaces so covered may be in the same vertical plane, with the face of the beam under the rafters; then that part of the ends of the rafters, projecting over the face of the beam under them, are called mutules.

19. If to the under side of the mutules be hung three rows of small conical frustums, of the same size of those under the regulæ of the architrave, so that there may be six in length in each of the rows, and three in width; then these conical frustums are also called guttæ, or drops, as those in the architrave.

20. The front of the beam lying over the mutules, is called corona, or drip, or larmier.

21. The under side of the beam, lying over the mutules, is called soffit, or lacuna.

22. A building whether of wood, or stone, or any other materials, having columns supporting an entablature over them, as described in the preceding Definitions; such a building, so constructed, is said to be of the Doric Order.

Having defined the principal parts of this Order, it may be not improper to observe, that the Doric Order has in general, more mouldings in the cornice; but as these vary in different buildings and as the members already described form its most striking features, it would therefore have been useless to have taken any account of them in the Definitions.

EXAMPLE I. PLATE 5.

Elevation of the Doric Order, from the Temple of Theseus, at Athens.

This beautiful little Temple is built of marble, and was erected about 480 years before Christ; it is considered one of the most perfect examples now remaining. The columns are about three feet four inches in diameter, and five diameters, thirty two minutes in height;—the entablature is two diameters and eight minutes. The column and entablature, are seven diameters, forty minutes; if the column was twenty minutes higher, the diameter would be one eighth of the entire height, which perhaps would be near enough for practice in public buildings; but for small private houses, the whole height may be divided into nine, or nine and a half parts, allowing one part for the diameter of the column. Drawn agreeably to previous directions.

It will be observed that the Greeks never used either mutules, dentils, or modillions in the cornices of the sloping side of their pediments. The bed moulding in this example, is three and a third minutes in height, and three and a fourth minutes in projection; and is described precisely like the lower member of the cymantium. The whole size of this is recessed up into the soffit of the corono.

The curve and form of the soffit, is like that in the Corinthian Order of Lysicrates,—the bed moulding and soffit in plate 1, or that in the Temple of Illyssus is better adapted to the purpose, and for practice at the present day, both for the Doric, Ionic and Corinthian, where mutules and dentils are used in the lateral cornices.

A. Section through the cornice, and the manner of capping the triglyphs;—drawn large.

B. Section of the tænia, regula and guttæ or drops.

C. Half of a mutule placed at the angle.

D. Section of the capital. Fig. 2, plate 9, is the antæ capital and base of this example.

EXAMPLE II. PLATE 6.

Elevation of the Doric Order on the Temple of Minerva, at Athens, called the Parthenon.

This example is one of the most magnificent of Grecian Architecture now remaining. It was constructed of the finest marble of the order periptere octastyle, viz. having eight columns on each front, and seventeen on each side including those at the angles, each column measuring six feet one inch in diameter, and including capital, thirty-four feet two inches in height. Its ground dimensions were, two hundred and twenty-five feet in length, and one hundred feet in breadth; and the entrance on each front was twelve feet six inches in width and twenty-eight feet eight inches high. Fig. 2, plate 4, is an ideal restoration of this Temple, in perspective.

A. Elevation, showing the return of each flank at the angle of the building.

B. Elevation through the pediment.

C. Plan of the soffit at the angles.

E. Section through the cornice, and the manner of capping the triglyphs.

F. Plan of the triglyphs, tænia, regula and drops at the angles of the building.

G. Elevation of the same.

EXAMPLES 3 AND 4.—PLATE 7.

A. Elevation of the great hexastyle Temple at Pæstum.

B. Section through the entablature.

C. Plan of a mutule.

D. The echinus of the capital.

E. Profile of the annulets.

F. The detail of astrigal.

Fig. 3, plate 9, is the antæ capital of this example.

Fig. 1. Elevation of a Grecian Doric Order, the height expressed in diameters and minutes.

Fig. 2. Elevation of a Doric column and entablature,—its proportions from Fig. 1.

Fig. 3. Section through the entablature of Fig. 2.

Fig. 4. Profile through the front of the cornice.

Fig. 5. Section of capital.

The projections of these two examples are counted from a vertical line passing through the centre of the column and entablature.

EXAMPLE V. PLATE 8.

I have here given an example of a Doric entablature and capital of a column, with all their details expressed in minutes.

PLATE 9.

Examples of Antæ.

This is a species of square columns attached to a wall or building, either in a line with the columns, or behind them: in Grecian architecture, the capitals of the antæ differ from those of the columns, but in Roman they are the same. The following examples, taken from Grecian buildings, will show how they differ from the columns of the same building.

A. Elevation of the entablature and antæ, from the charagic monument of Thrasyllus. Fig 6, is the antæ capital drawn to a large size. The projections of the mouldings in this example, are counted from a vertical line, passing through the centre of the antæ and entablature.

B. From the inside of the portico of the Temple of Minerva at Athens, called the Parthenon. Fig. 8, is a section of the cornice in B.

C. From the inside of the Doric portico at Athens.

D. and E. Two examples for antæs, which can be applied for frontispeeies, inside finishing, and in many cases for terraces, towers, &c.

D. Is divided into seven parts, one of which gives the diameter. Fig. 7, is the capital to D.

E. Is divided into eight parts, one of which is the diameter. The antæ capital from the Erectheon, or from the temple of Minerva polias can be applied to this example.

Fig. 1. From the Parthenon at Athens.

Fig. 2. Capital and base, from the Temple of Theseus, at Athens.

Fig. 3. From the hexastyle Temple at Pæstum.

Fig. 4. From the Doric portico at Athens.

Fig. 5. From the propylea at Athens.

IONIC ORDER.

It has already been observed, in the general definitions of the orders, that every order consists of a column and an entablature.

Every column consists of a base, shaft, and capital, except in the Doric where the base is omitted.

Every entablature consists of an architrave, frieze, and cornice.

The base, shaft, capital, architrave, frieze and cornice, are the principle members of an Order, and the peculiar mode or form of the members determines the particular name of the Order. But, as many of the mouldings are common to all the Orders, and are generated in a similar manner, what has been said in the general definition, and also on the Doric Order, will render it unnecessary to repeat the same things here, as such mouldings cannot form any particular feature of any particular Order. I shall therefore show, in the following definitions, how these members ought to be modified, so that they may constitute that Order, invented by the Ionians, and called from their name, the Ionic Order.

DEFINITIONS.

1. If, from the underside of the abacus of an Order there project two or more spirals on each end of the front, in a plane, parallel to the frieze, so that the extremity of each shall be at the same distance from the axis of the column; and also two others on the opposite side of the abacus, parallel to the former and projecting the same distance from the axis of the column, so that each of the spirals shall have the same number of revolutions, and equal and similar to each other; the projecting part contained between any two spirals is called a volute.

2. An order which has volutes and mouldings in the capital of the annular kind, and the ichnography of the abacus square, as in the Doric Order, the architrave finishing of plain faciæ and mouldings, either plain or enriched, the frieze, a plain surface, the cornice consisting of a simarecta, then a fillet and an echinus only; and if to the

underside of the corona are hung a row of equal and similar parallelopipeds equidistant from each other, whose fronts are in a plane parallel to the plane of the frieze, then each of these parallelopipeds is called adentil.

3. An Order so constructed is similar to that invented by the Ionians, and consequently, is the Ionic Order.

EXAMPLE I. PLATE 10.

Elevation of the Ionic Temple on the river Illysus, near Athens.

On the southern bank of the Illyssus, not far from the fountain Enneacrunas, (which at present, having recovered its ancient name, is called Callirrha are the remains of a little Ionic Temple. The mouldings are but few in number, and differ much from all other examples of that Order. Their forms being very simple, but withal so elegant, and the whole so well proportioned, that it may well be ranked among those works of antiquity which are most entitled to our attention. This little temple was built of marble, from the quarries of Mount Pentilicus, and was of the order of amphiprostyleas tetrastyle. Amphiprostyleas, plate 4, is the ground plan of this Temple, (Stuart and Revely*) only the two centre columns on the west portico in front are wanting; but in the place where they stood, circles are marked on the pavement or steps, which are exactly of the dimensions with the remaining columns; and were evidently designed as an accurate guide to the workmen, when they ereeted those eolumns which are now destroyed.

To the left hand of the plate is the order of the Temple.

To the right is the plan of one half of the capital, half the size of the original.

In the centre is a section and elevation of the capital half the size of the original.

PLATE 11.

Fig. 1. The cornice from the Temple on the Illysus, half the size of the original, and a method of drawing the raking mouldings to mitre with the horizontal. To describe which, observe the following

Rule.—Draw a vertical line through the centre of the height and projeetion A B C D, and divide it into four equal parts; then draw another line at right angles, through the centre at D. Extend the eompasses the distance of three of these divisions, and with one foot in D, set off E and F. In E, draw from D down to the first division, and in F, draw up to the first division; then draw the diagonal lines from E down, and from F up, and intersecting the eurve and division lines at their juneture, and G H are the centres to complete it.

Then draw the line A C at right angles with the rake of the moulding, and make the raking projection A B, equal to A B the level projeetion; the remainder is drawn in the same manner as the level or horizontal moulding.

Fig. 2 and 3. The base and capital of the antæ, half the size of the original.

Fig. 4. Base of column, half the size of the original.

Fig. 5. Architrave band, of the full size.

Fig. 6. Bedmould, of the full size. If it should be required to execute this example, I would recommend the bedmouldings from the Erectheon or that on plate 1, or else enlarge this to the proportion of those.

PLATE 12.

Spirals of the volute from the capitals of the Temple on the Illysus, showing a section through the face, seven eighths of the size of the original.

TO FIND THE CENTRES FOR DRAWING THE SPIRAL TO THIS VOLUTE.

Rule.—Having described the circumferenee of the eye, whose diameter is six and a half minutes—and drawn the horizontal line *m n* through the centre at *o*, divide *m o*, into two parts at 3, and produce the vertical line 3 2, equal to one of the two parts;—from 2, draw a line parallel to *m n* and terminating perpendicular from *n*; divide the vertical line 3 2, into four equal parts, and set two of these parts on each side to the right and left of *o* and join 4 5—6 7—8 9—10 11; then from the centre of the line 4, *n*, raise a perpendicular up to the outer circumference of the eye at 1, and join 1 2, when 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, will be the centres for drawing the outside spiral to the volute. Then to draw it,

Set the dividers in 1, and extending them up to the top of the volute at *a*, describe the arc *a b* until it intersects the continued line 1, 2; then set in 2, *b*, and draw *b c*, then 3 *c*, and draw *c d*, and so forth from all the centres.

Or you may reverse the process of drawing, by setting first in 11, *l* and drawing *l k*, and in 10 *k*, draw *k j*, and so forth.

To the left of the plate against the hem to the top of the volute, A B C D E F G H I J K L M shows a method of diminishing the hem of the volute.

PLATE 13.

Erectheon at Athens.

"To the north of the Parthenon, at the distance of about 150 feet, are the remains of three contiguous temples. That towards the east was called the Erectheon; to the westward, but under the same roof, was the Temple of Minerva, with the title Polias, as protectress of the eity; adjoining to which, on the south side, is the Pandrosium, so named, from its being dedicated to the nymph Pandrossus, one of the daughters of the Cecrops. To the left hand of the plate, is seen the portico of the Pandrosium; the entablature and roof supported by caryatides. To the right is the hexastyle portieo of the Erectheon, and in the eentre is the tetrastyle portico of the Minerva Polias. The whole edifice was called by Pausanius, the Erectheum, after an appellation of Neptune, and because it contained the salt spring called Erectheis; and not because within it was the tomb of Erecthonius, fourth king of Athens. This celebrated edifice was erected in the age of the illustrious Pericles, when taste and invention were in their meridian among the Athenians, and when they were anxiously engaged in restoring the temples whieh had been destroyed by the Persians. In this beautiful speeimen of the Ionic Order, they seem to have been ambitious of excelling their Asiatic brethren, in their own peeuliar Order of arehitecture, by the addition of new and elaborate ornaments, imagined with the utmost ingenuity and eleganee of taste, and executed with the sharpness and perfection of a cameo, which it could hardly have been supposed that marble was eapable of receiving."

EXAMPLE II. PLATE 14.

Fig. 1. The Order of the portico of the Erectheon.

Fig. 2. Profile of the upper mouldings of the cornice, about one-fourth of the size of the original.

Fig. 3. The bedmould; full size of the original.

Fig. 4. The architrave band; ditto.

Fig. 5. Base of columns; one-fourth original size.

Fig. 6. Ovolo of the cymatium; drawn to be earved.

Fig. 7. Architrave moulding; ditto.

Fig. 8, and 9. Centres to draw the spirals. Either of these methods will draw a spiral to the height of about thirty-six minutes, though the width and form differs a trifle.

PLATE 15.

A. Half the elevation of the capital of the Erectheon, showing a section through the face; one-fourth size.

B. Flank elevation; one fourth original size.

C. Plan of capital; ditto.

D. Half the elevation of the antæ capital; ditto.

E. Base of the antæ; ditto.

F. Section of the eye of the volute; full size.

*James Stuart, called the Athenian Stuart; a very celebrated traveller and delineator of Athenian architecture, died in 1788, aged 76. Willey Revely, a very ingenious English architect, who published a collection of drawings which are universally known to the lovers and admirers of classic antiquity; he was also known as the editor of the posthumous volumes of Stuart's Antiquities of Greece, and died in 1799.

PLATE 16.

Fig. 1. The order of the portico of the Temple of Minerva Polias.

Fig. 2. Half the elevation of the capital of Minerva Polias, with horizontal and vertical sections through the front; half the original size.

Fig. 3. Stretch out of the echinus, and plaited torus of the capital; full size of the original.

Fig. 4. Base of the columns; one fourth size.

Fig. 5. The eye to the volute; full size of the original, showing more clearly how to find the centres in drawing the spirals.

TO FIND THE CENTRES IN DRAWING THE SPIRAL TO THIS VOLUTE.

RULE.—Having described the circumfcrence of the eye, whosc diameter is five and two tenths minutes—and drawn vertical and horizontal lines through the centre at *o*, as in Fig 5, divide the vertical line from *o* up to the circumfercnce of the eye, into nine equal parts;—continue the vertical line from the circumfercnce up, the distance of three of these parts, and divide this continued line into three equal parts, subdivide the upper part or division into four equal divisions, the third of which from the top down at 1, will be the first centre. From the fifth division of the vertical line, up from *o*, draw a horizontal line to 2, equal in length to seven of the nine parts; from 2 draw a vertical line down, equal in length to six of these parts; thence draw a horizontal line to the left, thc distance of nine parts. A continued diagonal line from 1, cutting the angle at 2, will show the termination of the first arc of the spiral, and a similar line from 2, cutting the line 3, 4, at the distance of half a part from the angle near 3, will show the termination of thc second arc. The remaining centres, and the terminations of the arcs, may readily be found by an inspection of the diagram in the circumference of the eye. The centres being found, proceed to draw the outside spiral as described in plate 12. The middle hem is to be drawn in the centre of the two outside spirals, as represented in the plate.

PLATE 17.

One quarter of the plan of the capital of Minerva Polias; half the size of the original.

PLATE 18.

One quarter of the flank elevation of the capital of Minerva Polias; half the original size.

PLATE 19.

Fig. 1. Elevation of one half the antæ capital of Minerva Polias; half of the original size.

Fig. 2. The base of the antæ; ditto.

Fig. 3. Flank elevation of the cornice from the portico of Minerva Polias; one eighth the size of the original.

EXAMPLE IV. PATE 20.

From the Temple of Minerva Polias at Priene in Ionia.

Fig. 1. The ordcr from the Temple, showing the elevation of the entablature on the flanks of the building.

Fig. 2. Elevation of the entablature on the front of the pediment.

Fig. 3. Section through the cornice of the pediment. It is remarkable that the enrichment of the upper mouldings differs from that of the lateral cornice.

Fig. 4. Plan of the dentils, showing on the angles of the building.

Fig. 5. Section through the cornice on the pediment.

E. In plate 28, represents the cornice of this example on a large scale, showing the soffit of the corona; though I have taken the liberty of altering the proportions a trifle where I thought necessary; and in drawing the capital in plate 21,have done the same, which makes it, in my own opinion, more perfect and beautiful.

The diameter, or scale upon which this capital is drawn, being 12 1-4 inches, renders it suitablc in size for practice, in small porticos. This example, with thc exception of the base, which is somewhat objectionable, is not inferior to any other example of the order.

PLATE 21.

A. Represents half the elevation of the capital of Minerva, at Priene in Ionia, with a section through the front.

B. One quarter of the flank elevation, with a section of the same.

C. One quarter of the plan.

D. A moulding, which can be applied for the abacus, ornamented at the angles.

E. A plan of one half of the capital from the remains of the Temple of Apollo Didymaus, near Miletus in Ionia. Supposing that many architccts might prefer this capital to one before described, I have thought proper to give a plan of it; but the form of the hem, and the spirals to the volutes, being so similar to the other examples of the order, I have deemed it unnecessary to make a full drawing of it.

F. The eye to the volute, drawn on a large scale.

TO FIND THE CENTRES, IN DRAWING THE SPIRAL TO THIS VOLUTE.

RULE.—Having described the circumference of the eye, whose diameter is 2 3-5 minutes, and drawn a vertical line through the centre; inscribe within this circumference, a hexagon, having three of its sides upon each side of the vertical line. Divide the two upper and two lower sides into three equal parts each, and draw a line from 1, through the centrc of the eye down to 3, and another from 2, down to 4, when 1, 2, 3, 4, will be the first centres. Then divide thcse two diagonal lines into six cqual parts each, three above and three below the centre of the eye, and 5, 6, 7, 8, 9, 10, 11, 12, are the second centres. Then divide three of these lines, viz. centre, 9—centre, 10—centre, 11, into two equal parts each, and 13, 14, 15 are the centres complete for drawing the outside spiral of four revolutions. The spiral is then drawn from the same rules as the spirals of three revolutions, which havc already becn described.

EXAMPLE V. PLATE 22.

From the Temple of Bacchus at Teos in Ionia.

This Temple was first began in the Doric Order by Hermongenus, but he afterwards changed it into the Ionic, and dedicated it to Bacchus.

This example is drawn from an accurate measurement of that celebrated building; and by diminishing the columns to fifty minutes at their upper diameters, may be reckoned among those works of antiquity which most deserve our attention. The architrave is well proportioned to itself, and also the cornice; the dentals of the cornice add greatly to the character of the order.

The capital, and the spirals of the volute hem are elegant and beautiful, and the base I think not inferior to any other of the order.

The base of the columns, it is thought, from the little difference between the shaft at the base here exhibited, did not belong to the capital shown in Fig. 2, but to some of the interior columns; for the ancients always made the interior ranges of columns less in diameter than the exterior, as is to be found in the celebrated Athenian buildings, the Temple of Minerva and the Propylea. F in Plate 28 is the cornice to this example on a large scale. Should it be required to execute this example without enriching the upper moulding of the cornice, the entablature from Plate 24, or that from Plate 25, would, perhaps, be more suitable for practice at the present day.

Fig. 1. The order from the Temple.

Fig. 2. One half of the capital, with horizontal and vertical sections through the spirals of the volutes.

Fig. 3. A section through the front of the capital.

Fig. 4. The base of the column.

Fig. 7. The architrave band.

Fig. 8. The cornice, drawn on a large scale. The projections of the mouldings are counted from a vertical line passing through the cornice perpendicular to the frieze; the remaining parts are counted from the centre of the column and architrave.

Fig. 5. The eye of the volute, on a large scale.

TO FIND THE CENTRES IN DRAWING THE SPIRAL TO THIS VOLUTE.

RULE.—Having described the circumference of the eye, whose diameter is 3 5-8 minutes, draw a horizontal line through the centre of the eye at *o*, and divide it into eight equal parts; set off two of these parts from *o* down, and one part from *o* up; draw a line from 1 to 2, equal in length to six parts of the eight; from 2 to 3, equal in length to three parts of the eight; from 3 to 4, equal to five of these parts; and from 4 to 5, equal to two and a half parts; then find the other centres as the figures direct. The whole will appear more clear by inspection, than it can be made by description.

Fig. 6. A method of diminishing the hem of the spirals.

CORINTHIAN ORDER.

DEFINITIONS.

1st. An order which has two annular rows of leaves capital, each leaf of the upper row growing between those of the lower row in such a manner, that a leaf of the upper row may be in the middle of each side of the face of the capital; and if between each space of the upper leaves there spring stalks with volutes, two of which meet at the angles of the abacus, and two in the middle of the capital, either touching or interwoven with each other; a capital so constructed is called Corinthian.

2d. An order which has a Corinthian capital and an Ionic, or any other entablature, is called the Corinthian order.

EXAMPLE I. PLATE 23.

Corinthian order, from the Monument of Lysicrates at Athens, commonly called the Lanthorn of Demosthenes.

Fig. 1. The order from the monument.

Fig. 2. Base of the columns, half the size of the originals.

Fig. 3. Plan of the capital.

Fig. 4. Profile of the capital.

Fig. 5. Section of the cornice—half the size of the original.

Fig. 6. Plan of the Dentils.

EXAMPLE II. PLATE 24.

Corinthian order imitated, from the arch of Adrian at Athens.

In the example here given, the capital, base, and all the mouldings throughout the whole order, are of the Grecian style; the upper torus of the base may be either fluted or left plain as choice may direct. If the mouldings, in the cornice and architrave are to be enriched, they can be drawn and carved in the style of F and G, Plate 25.

A. A Grecian Corinthian antæ capital and base.

B. Profile of the above capital, appertaining to the same.

C. Profile of the capital of the columns.

PLATE 25.

In this plate I have given an example of a Composite order, drawn after the Grecian style. The proportions are nearly the same as those in plate 24.

This order is of Roman origin. It has been suggested by many eminent modern writers, that there are but three orders in architecture, and it is well known that this order was taken from the Ionic and Corinthian orders. It was first practised by the Romans in their triumphal arches, which were erected to show their dominion over those whom they had conquered.

Of this order we have many eminent examples, but the arch of Titus, at Rome, is considered the most celebrated. It was erected soon after the destruction of Jerusalem, in commemoration of that remarkable event. The capital is about seventy-four minutes in height, and the entablature about two diameters and thirty-three minutes.

A and B. The bed mould and a plan of the dentals, on a large scale, in which I have drawn the dentals one minute less in width than those on the order.

C. The architrave band, on a large scale.

D. Can be used for the architrave band, if preferred, with E for the base.

G and F, Shows the method of drawing the mouldings, to be carved after the Grecian practice

PLATE 26.

This plate represents the details of Plate 25; the plan of the capital, a section through the front, and a method of drawing the spiral to a height of twenty-eight minutes. The eye of the volute being drawn large, will show more clearly how to find the centres, for which purpose observe the following

RULE.—Having described the circumference of the eye, whose diameter is 6 minutes, draw a vertical line through the centre of the eye, and divide it into six equal parts; set one of these parts up and one down from the centre, and make the line 9, 10, equal to one of the six parts, and the line 11, 12, equal to another; then draw lines diagonally from 10 and 11 to the centre of the eye, and divide each of them into three equal parts; then join 1, 2 and 3, 4, and so on, which will give the centres from which to draw the outside spirals. Set your compasses in 1, the first division below the centre of the eye, and, extending them up to the circumference at *a*, describe the arc *a*, *b*; set again in 2, *b*, and describe the arc *b*, *c*; in 3, *c*, and describe *c*, *d*; and thus proceed until the spiral is completed.

DEFINITIONS OF ORNAMENTS.

1. An artificial arrangement or disposition of leaves is called foliage.

2. The subdivisions of single leaves are called raffles. The leaves which are chiefly used in architecture, are the acanthus, olive, parsley, laurel and lotus.

3. An artificial arrangement of leaves, branches, fruit, flowers, drapery, &c. either singly or combined in any manner with each other, are called ornaments in architecture.

4. A string, consisting of flowers, fruit, leaves, and branches, either singly, by themselves, or intermixed with each other, and supported at the two extremes, the middle part forming itself into a curve by its gravity; this figure, so suspended, is called a festoon.

5. A curve line, which is continually changing its course in contrary directions on the same side of it; that is, first concave and then convex, covcave again, and then convex again, and so on alternately in this manner, to any number of curves of contrary flexure, is called a serpentine line.

6. If from a stalk, in the form of a serpentine line, a number of branches issue out, twisting themselves in the form of spiral lines on each side of the serpentine line, in all the concave parts on the alternate sides of it, and if these spirals and the stalk be decorated with foliage, a composition so formed is called winding foliage.

TO DRAW ORNAMENTS.

The learner should, in the first place, draw a great variety of curve and spiral lines of different descriptions, and compare these figures with each other, by which means he will be able, by sight only, to distinguish one particular species of curve from another; then he ought to imitate, with precision, the same things by hand, in all the varieties of positions which he can suggest to himself; and thus he will acquire a freedom of hand in every direction. When he proceeds to copying leaves, a general outline ought to be drawn, circum-

scribing the whole leaf; he should then form outlines of all the veins, and round every compartment, circumscribing all the different sets of points or raffles; and afterwards proceed to draw the raffles themselves. The learner having, after sufficient practice in copying, acquired a freedom of hand, I would then advise to draw from nature a variety of such things as will be most suitable to the purposes to which they are to be applied. By so doing, the parts of his compositions will always appear rich and natural; and hence he will obtain a greater facility of invention. Having had sufficient practice in drawing from nature, he may then apply himself to the designing of ornaments, for which purpose he will find the first part of the problem, viz. that of drawing curve and spiral lines by hand, to be of the utmost utility in forming the general outlines of his designs; and for finishing the smaller parts, such as raffles, flowers, fruits, &c. he must apply the knowledge he has acquired in drawing from nature, which will complete his composition.

ELEMENTS OF FOLIAGE.

Leaves.

Of the acanthus, or bear's-breech, or branhursinæ, there are several different species.

1. The mollis, or common bear's-breech, a native of Italy.
2. The spinosus, or prickly bear's-breech, the leaves of which are deeply jagged in every regular order, and each segment is terminated with a sharp spire, as is also the compalement of the flower, which renders it troublesome to handle them.
3. The ilisifolias, or shrubby bear's-breech, grows in both the Indies. It is an evergreen shrub which rises about four feet high, and is divided into many branches, garnished with leaves like those of the common holly, and armed with spires in the same manner; the flowers are white, and shaped like those of the common acanthus, but smaller.
4. Nigra, or Portugal bear's breech, with smooth sinuated leaves, of a livid green color.
5. The middle bear's-breech, with entire leaves, having spires on their border.

PLATE 27.

Represents the designs of capitals for antæs or pilasters, and ornamental leaves, from the remains of celebrated buildings of Grecian antiquity; and a method of commencing draughts of them.

Fig. 1. Ornamental leaf, taken from the arch of Adrian, at Athens.

Fig. 2. Profile of the same leaf.

Fig. 3. From the Temple of Pola, in Istria.

Fig. 4. Profile of ditto.

Fig. 5. Ornamental leaf, from the monument of Lysicrates at Athens, commonly called the Lanthorn of Demosthenes.

Fig. 6. Profile of ditto.

Fig. 7 and 8. A general outline of figures 5 and 6.

Fig. 9. From the arch of Adrian at Athens.

Fig. 10. Profile of ditto.

Fig. 11 and 12. A general outline of Figures 9 and 10, showing the method of beginning to draw leaves.

Suppose it were required to draw Figures 9 and 10, either in the same or any other ratio.

First, inspect Figures 9 and 10; then, as in Figures 11 12, draw a faint curve line with a pencil, circumscribing the contour or general outline of Figures 9 and 10, then describe curve lines similar; in Figures 11 and 12 draw lines faintly, circumscribing the compartments or divisions of 9 and 10; then draw similar lines in 11 and 12, observing that all the parts are similar to 9 and 10; next draw the raffles and veins in the compartments of 11 and 12; and lastly, with a pen, draw in ink all the parts of the leaf represented in 9 and 10, and in 11 and 12; then rub your drawing clean; the pencil marks will disappear, and the remaining ink lines will represent a figure similar to Figures 9 and 10.

This explanation will serve for all following examples, however dissimilar. I would advise the learner to practice in each variety of ornamental foliage exhibited in this work, by which means he will be enabled to practice, if necessary, any other style of ornamenting, however different.

PLATE 28.

Examples for Cornices.

I am well aware that there can be no invariable rule in determining the proportional height and projection of cornices, which will apply to the situation of all buildings, and therefore shall make but few observations upon the subject.

If a building has a front of forty feet, the cornice should be larger than that on a building of only twenty feet, though they are both of the same height.

The general height of the cornices in the Grecian and Roman Doric, and the Tuscan orders, is from one-twelfth to one sixteenth part of the entire height; and those of the Ionic, Corinthian and Composite, are from one-twelfth to one-twenty-second part of the entire height.

If it should be required to execute a cornice itself, from either of the five orders, it should be made somewhat less than if the whole order were added. In the proportion of columns, the architect must rely much upon his own judgment, for confident I am that no certain rule of proportion can be established, which will not be liable to many exceptions. It is, however, evident, that the column for a pediment of thirty-five feet front, should be larger than those for one of only twenty-five feet, although they may be equal in height, and the same number of columns required in each.

A, B, C and D, are four designs for dentil cornices; the dentils in B are diminished as may be seen on the plan of them; and those in A are diminished in the same manner, and capped.

E, Is the cornice from the Temple of Minerva Polias, at Priene in Ionia.

F. Cornice from the Temple of Bacchus, at Teos in Ionia.

PLATE 29.

Examples for Cornices.

Fig. 1, 2, 3. Three designs for cornices, calculated for small buildings and porticoes.

Fig. 4. A cornice, to the left of which is the architrave band, as executed on the house of G. W. Arnold, Esq. in East Hartford, opposite Hartford, Conn.

Fig. 5, 6. Two designs for dental cornices.

ROMAN ARCHITECTURE.

TUSCAN ORDER.

PLATE 30.

This order is very similar to the Doric, and is evidently derived from it. It was first executed by the inhabitants of Tuscany, from which it derives its name.

There are two orders of Italian origin, called Latin orders, which are distinguished by the names of Tuscan and Roman. They were probably invented with a view of extending the characteristic bounds on one side, still farther towards strength and similarity; and on the other towards elegance and profusion of enrichment. At what period these orders were invented, and by whom improved to such perfection, remains doubtful. Vitruvius has attempted to give their origin

and history, but his relation has been justly questioned, and is probably not much to be depended upon.

There have been a number of examples taken from the drawings of Paladio, Scamozzi, and other modern authors, and they all differ in their proportions, especially in the general character of their mouldings. I have selected the Trajan column, at Rome, for this example. This column is considered one of the proudest monuments of Roman splendor, and consists of a base, shaft and capital of the Tuscan order. It was erected by the Senate and people of Rome, in acknowledgment of the services of Trajan, and has contributed more to immortalize that emperor, than the united efforts of all historians.

De Cambria notices the Antonine column erected at Rome in honor of Antoninus Pius; and another similar one at Con-tantinople, raised in honor of the emperor Theodorus, after his victory over the Scythians; both of which prove, by their resemblance to the Trajan column, that this sort of appropriation, recommended by him, had passed into a rule among the ancient masters of the art. Though much has been written against this order, on account of its plainness, I shall not here dispute either the accuracy, justice or fitness of the remarks of other authors; but shall venture to affirm, that not only the Tuscan column, but the entire order, as exhibited in this work, may justly be considered elegant specimens of architecture, and in numerous instances, usefully and tastefully applied in practice. Besides, as an order, it is a necessary gradation in the arts, although not recognized by the Grecian architects.

Combining the idea of strength and simplicity, for rural purposes, it is not surpassed by any of the ancient orders, being peculiarly applicable to farm houses, coach houses, green houses, grottos, fountains, barns, sheds, &c.; to park and garden gates, and in short, wherever magnificence is not required and expense is to be avoided.

Sebastian Serlio recommends the use of it in prisons, arsenals, public granaries, seaports and gates of fortified places. Le Clerc observes, that although the Tuscan order is treated with contempt by Vitruvius, Paladio and others, as unworthy of being identified, yet, according to the composition of Vignola, there is a beauty in its simplicity which entitles it to notice, and recommends it to a place both in private and public buildings, as in porticoes and colonnades surrounding squares; even in royal palaces, if suitably introduced to adorn the inferior apartments, offices, &c. where strength and simplicity are required, and where richer and more delicate orders would be extremely improper.

TO DRAW THIS ORDER TO ANY GIVEN HEIGHT.

Rule.—Divide A, B, Fig. 1, into nine equal parts, as shown in the outside division in the margin of the plate, and give one of these parts to the diameter of the column just above the base at *c*, *d*; then divide *c d* into sixty equal parts (or first divide into six and subdivide into ten, as represented in the scale *c*, *d*, Fig. 1), and these divisions are called minutes, or sixtieths of the diameter of the column. I have drawn a scale of one module or thirty minutes in Fig. 4, and drawn all the details of this order large. The heights of the mouldings, and the aggregate heights are expressed in minutes by figures placed in the margin divisions. The projections of the mouldings are expressed in minutes by figures placed at the extreme projection of each member, and are counted from perpendiculars, raised at the extremities of the superior and inferior diameters of the shaft, or from the vertical line that is dotted, passing through the base, capital, architrave and cornice.

Fig. 1. Elevation of the order.

Fig. 2. Cornice, on a large scale.

Fig. 3. Capital, on a large scale.

Fig. 4. Base of columns, large scale.

Fig. 5. Architrave band, large scale.

Fig. 6. Capital after the Grecian style, which may be preferred to Fig. 3.

PLATE 31.

Fig. 1. Elevation of a Doric order, as approved by Sir William Chambers. On this plate are given three profiles of the Doric order.

Fig. 1, 2. Are copied by Ligorio* from various fragments of antiquity in and near Rome.

* Peter Ligorio, a Neapolitan, distinguished as a painter and architect. His designs composed thirty volumes. He died A. D. 1580.

Fig. 3. Entablature of Paladio, as executed in the Basilica, at Vicenza.

Fig. 4. Design for a Doric base, by Le Clerc.

PLATE 32.

Elevation of an Ionic Order, and its details, from Sir William Chambers.

PLATE 33.

Elevation of a Composite Order, and its details, from Sir William Chambers.

PLATE 34.

Elevation of a Corinthian Order, and its details, from Sir William Chambers.

PLATE 35.

A and B. Two examples for volutes.

TO DRAW A SPIRAL TO THE HEIGHT OF ABOUT THIRTY-FOUR MINUTES AS IN A.

Rule.—Having described the circumference of the eye, whose diameter is six minutes, draw a vertical line through the centre of the eye at *o*, as in D, and form on the left of the vertical line a square equal to two minutes, by setting one minute from *o* down and one up, and two minutes to the left of *o*, and drawing the lines 9, 10, 11, 12. Then draw the diagonal lines *o*, 10, and *o*, 11, and divide them into three equal parts each; likewise divide the vertical lines *o*, 9, and *o*, 12, into three equal parts each, and join 1, 2—3, 4—5, 6—and 7, 8, which gives all the centres for drawing the outside spiral. Then,

Set your compasses in 1, the first division below the centre, and, extending them up to the circumference at *a*, describe the arc *a*, *b*. Set again in 2, *b*, and produce *b*, *c*; and proceed in this manner until the spiral is completed.

Should it be required to draw the spiral for a middle hem, like those of the Temples of Erectheus, and Minerva Polias; for the four last centres, set one half of one of these divisions from 9 down, and produce a line parallel to 9, 10. Set the same distance to the left of 10, and produce a line parallel to 10, 11; the angles of these parallel lines at 9, 10, 11, are three of the required centres, and the middle of the vertical line *a*, 12, is the fourth and last centre, from which the spiral is drawn, as represented by the dotted line in A.

TO DRAW A SPIRAL TO THE HEIGHT OF THIRTY AND A HALF MINUTES, AS IN B.

Rule.—Having described the circumference of the eye, whose diameter is six minutes, set one minute from the centre of the eye at *o*, as in C, perpendicularly up, and divide it into three equal parts; set one minute upon each side from the third point perpendicular from *o*, and produce the lines 11, 12, and the diagonal lines 11, *o*—12, *o*; from 11, drop a vertical line, in length one minute and five-sixths of a minute, dewn to 10, and from 10 produce a horizontal line of one minute and two thirds in length to 9; the other centres may be readily found by an inspection of the Figure. The spirals are drawn as in A.

E, F and G. Ornaments designed for the eyes of the volutes, and are of the same size as C D.

Fig. 1, 2. Plan and elevation of one quarter of a Corinthian and Composite pilaster capital, from Sir William Chambers.

Fig. 3. Elevation of a leaf, from the capitals of the columns on the baths of Dioclesian, at Rome.

Fig. 4. Profile of Fig. 3.

Fig. 5, 6. Plan and elevation of a leaf taken from the Temple of Jupiter Stator, at Rome.

Pl. 1.

Fig 2

Fig. 1

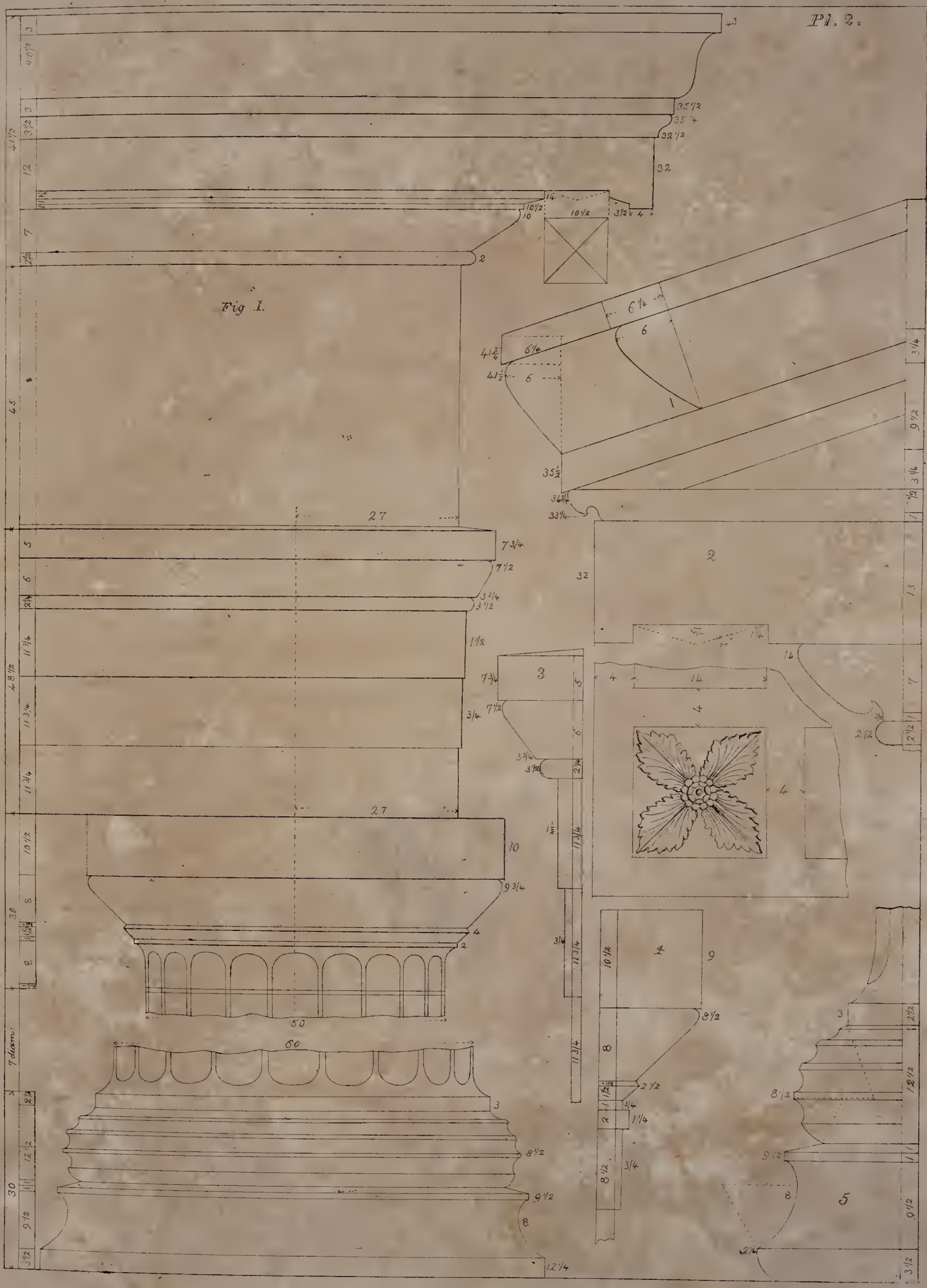
Fig. 3

F. 4

F. 5

F. 6

Pl. 2.

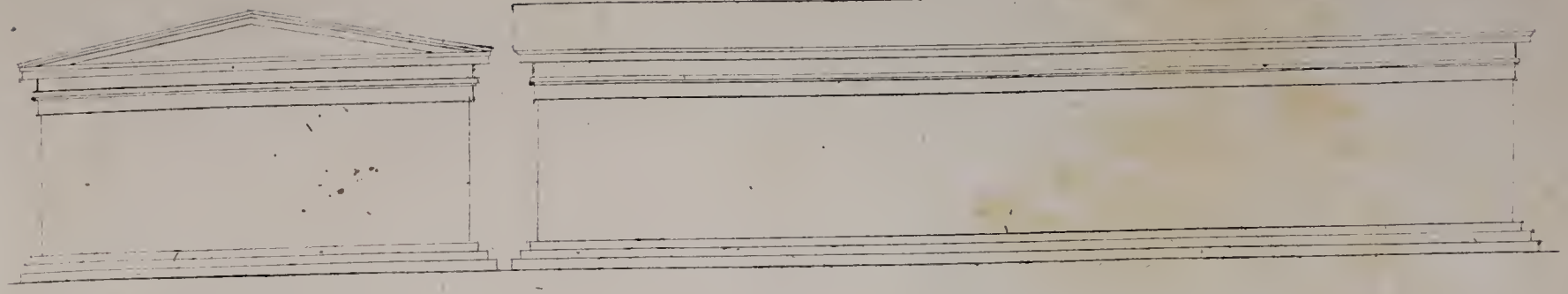


Pl. 3.

Fig. A

B.

C.



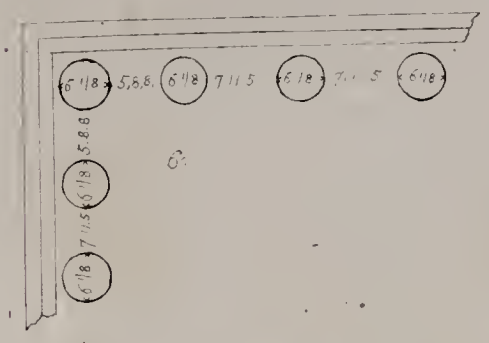
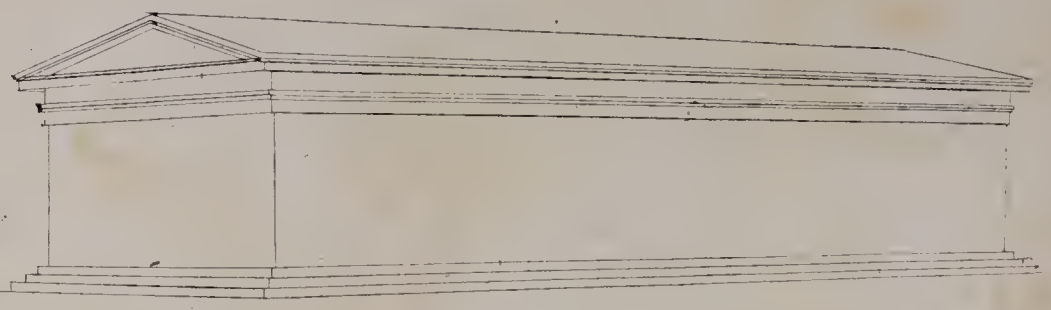


Fig. 1.



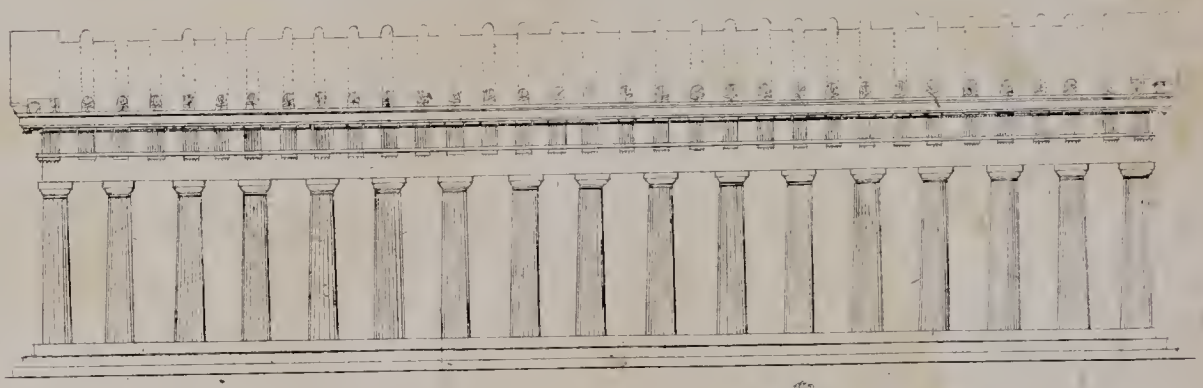
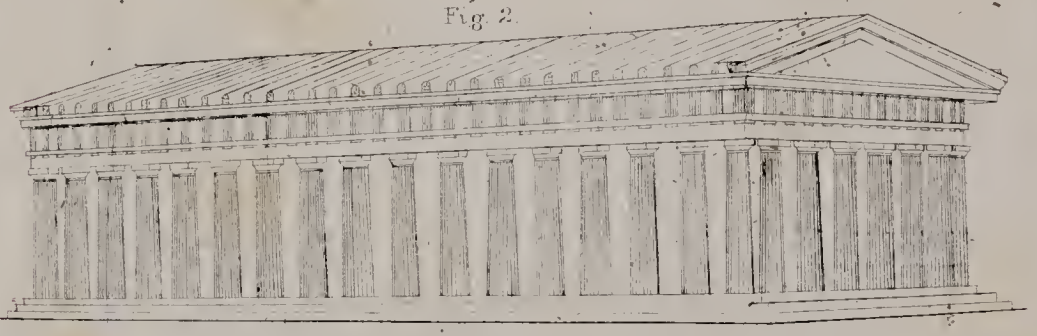
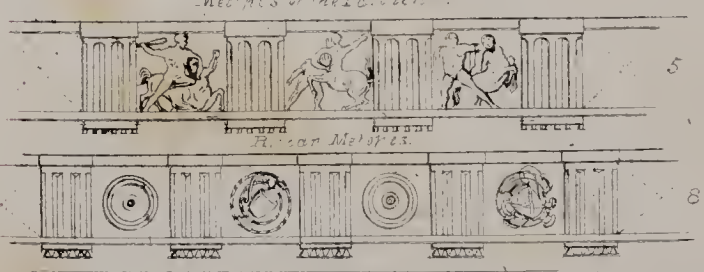


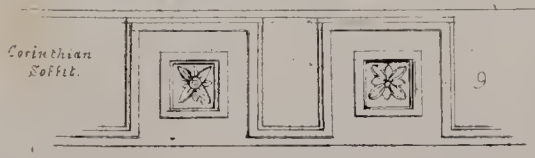
Fig. 2.



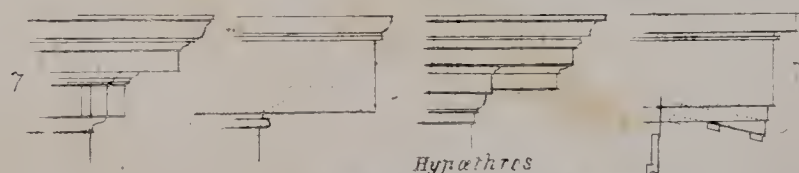
Metopes of the Parthenon.



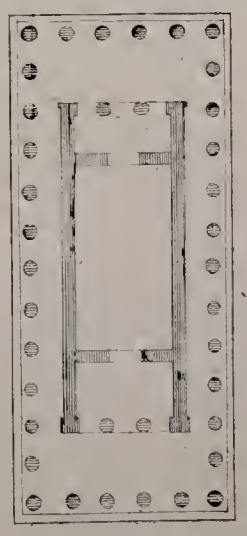
Roman Metopes.



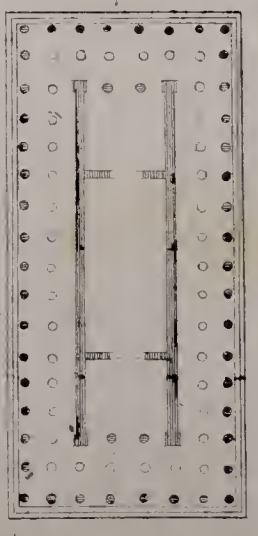
Corinthian Soffit.



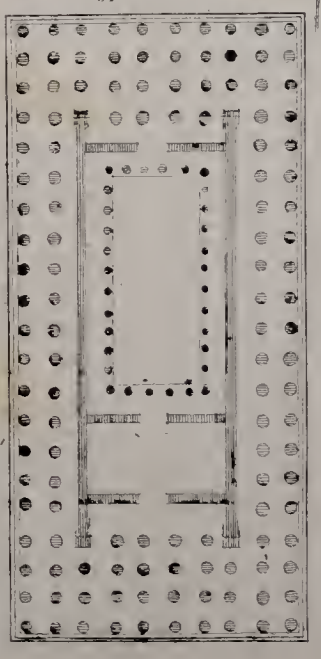
Peripteros.



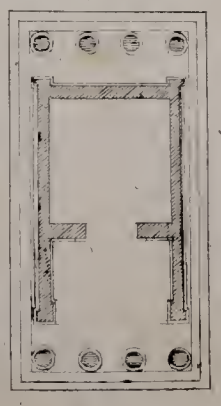
Dipteros & Pseudodipteros.



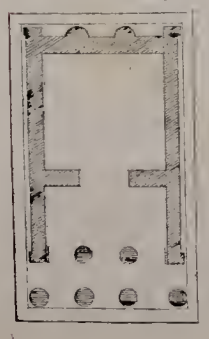
Hypæthros



Amphiprostylos



In Antis & Pustylos



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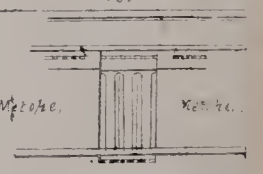
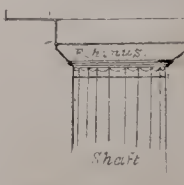
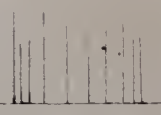


Metope. Triglyph.

Eustylium.



Shaft

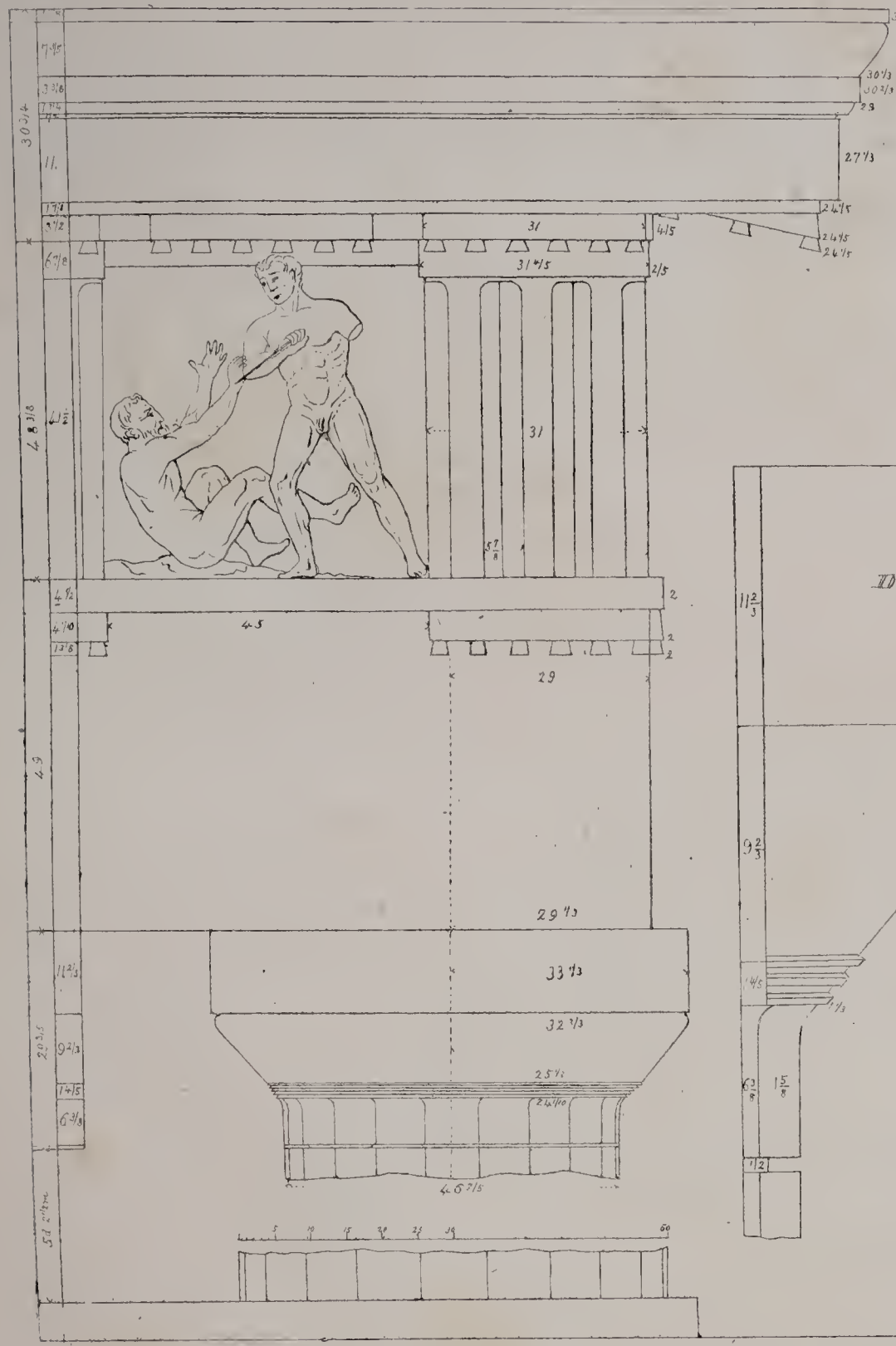


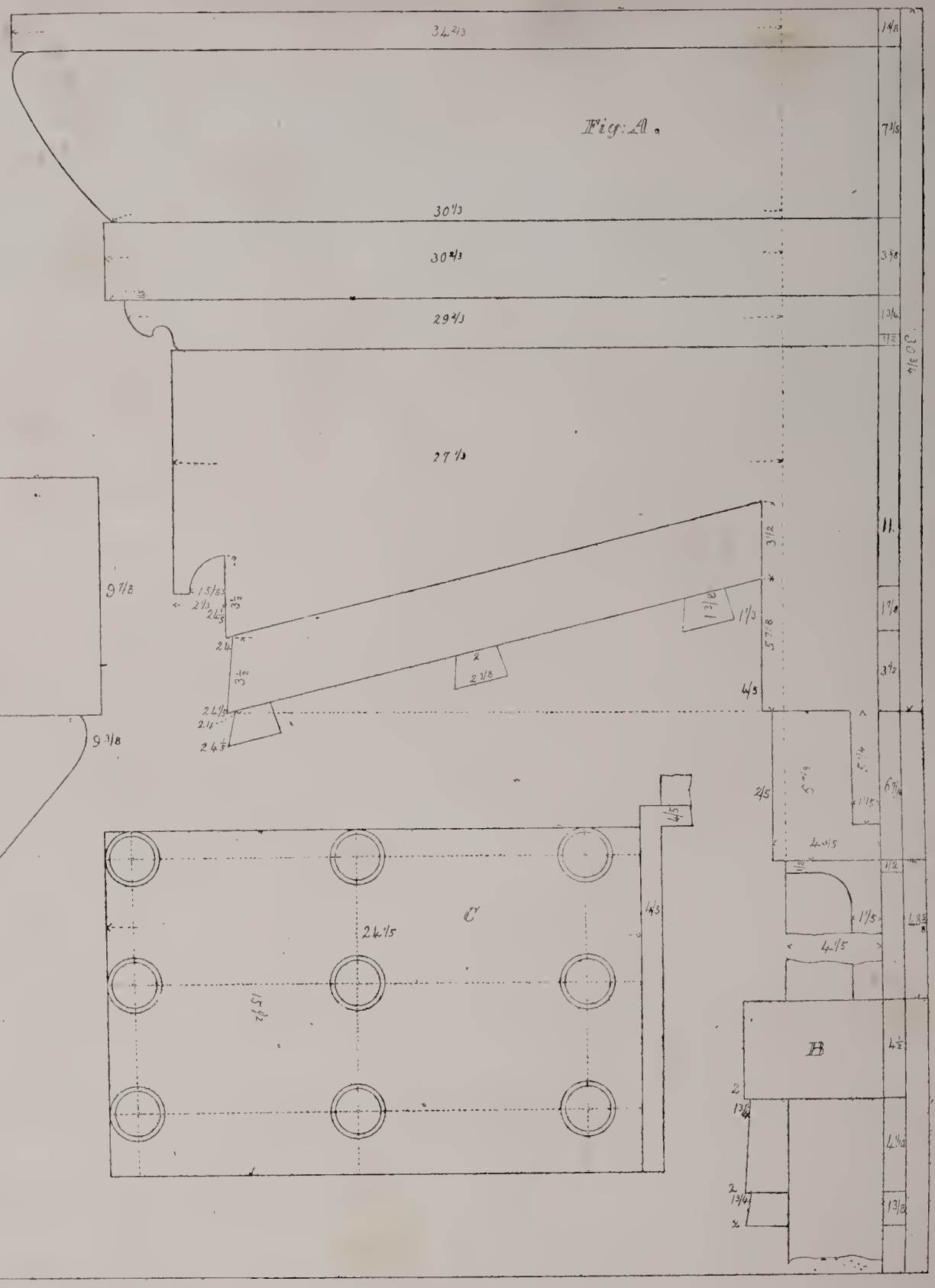
Base of Temple

Pl. 5.

DORIC ORDER.

From the Temple of Theseus, at Athens.





Pl. 6.

Lith. of Dlle. Bellory & Co

Column of the pronaos.

A

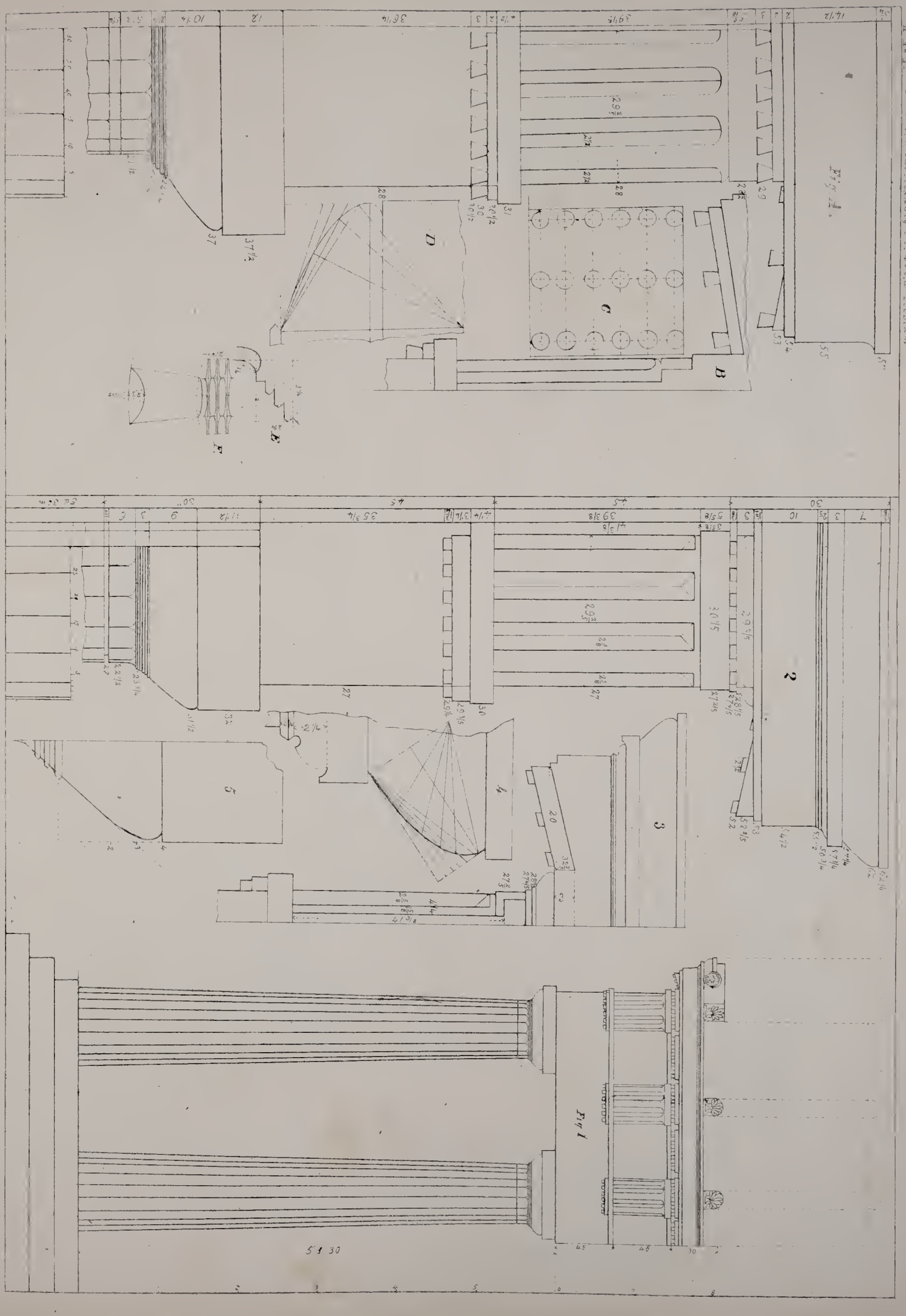
B

C

E

F

G


A
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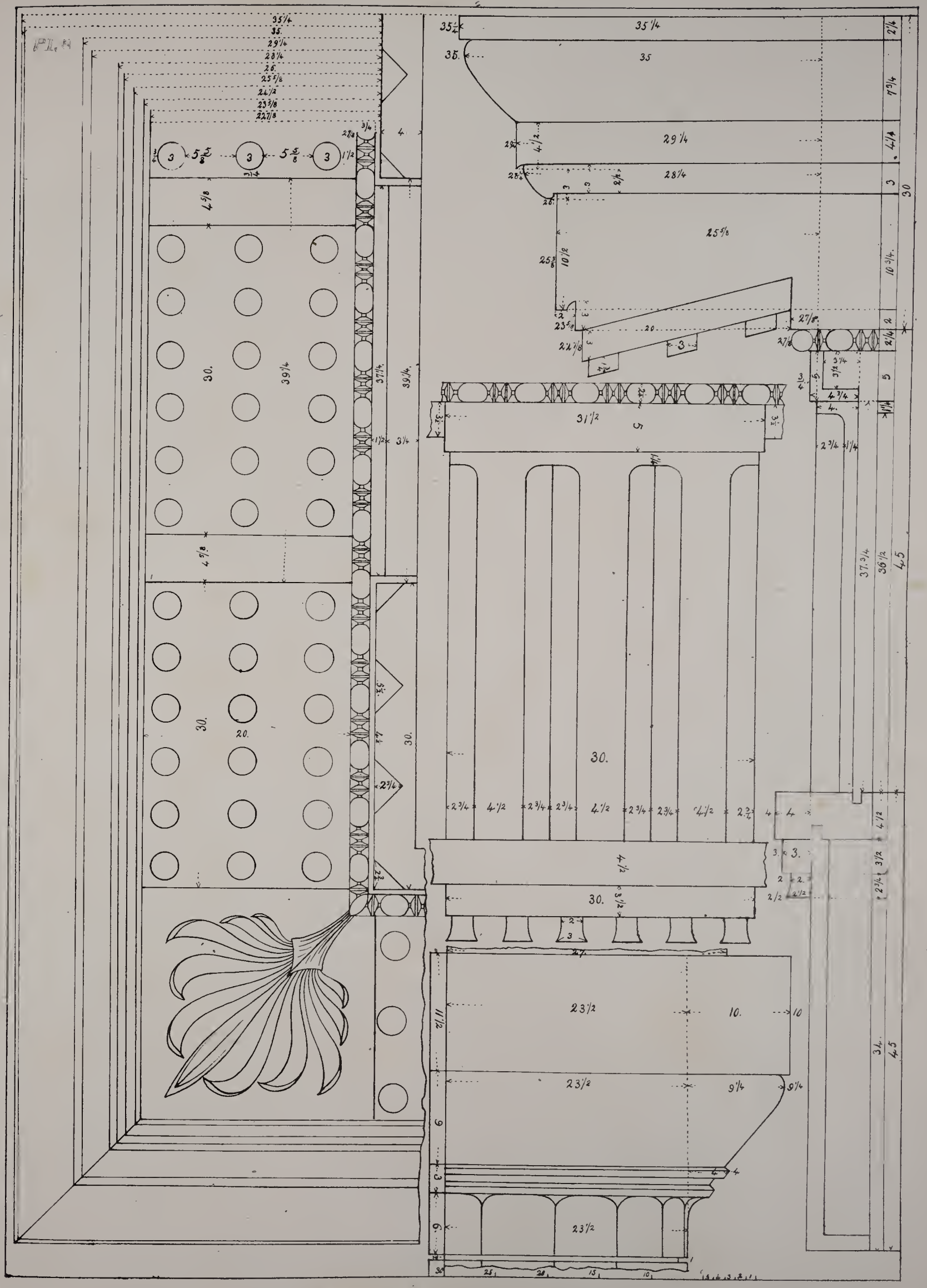
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23 5/8
22 7/8
27 1/8
31 1/2
23 1/2
11 1/2
9 1/4
37 3/4
36 1/2
34.
45

Pl. 9

Lith. of D.H. Kr. Hoop & Co.

B

E

D

Fig 8

Fig 7

Fig 1

Fig 3

Fig 2

Fig 4

Fig 5

Fig 6

C

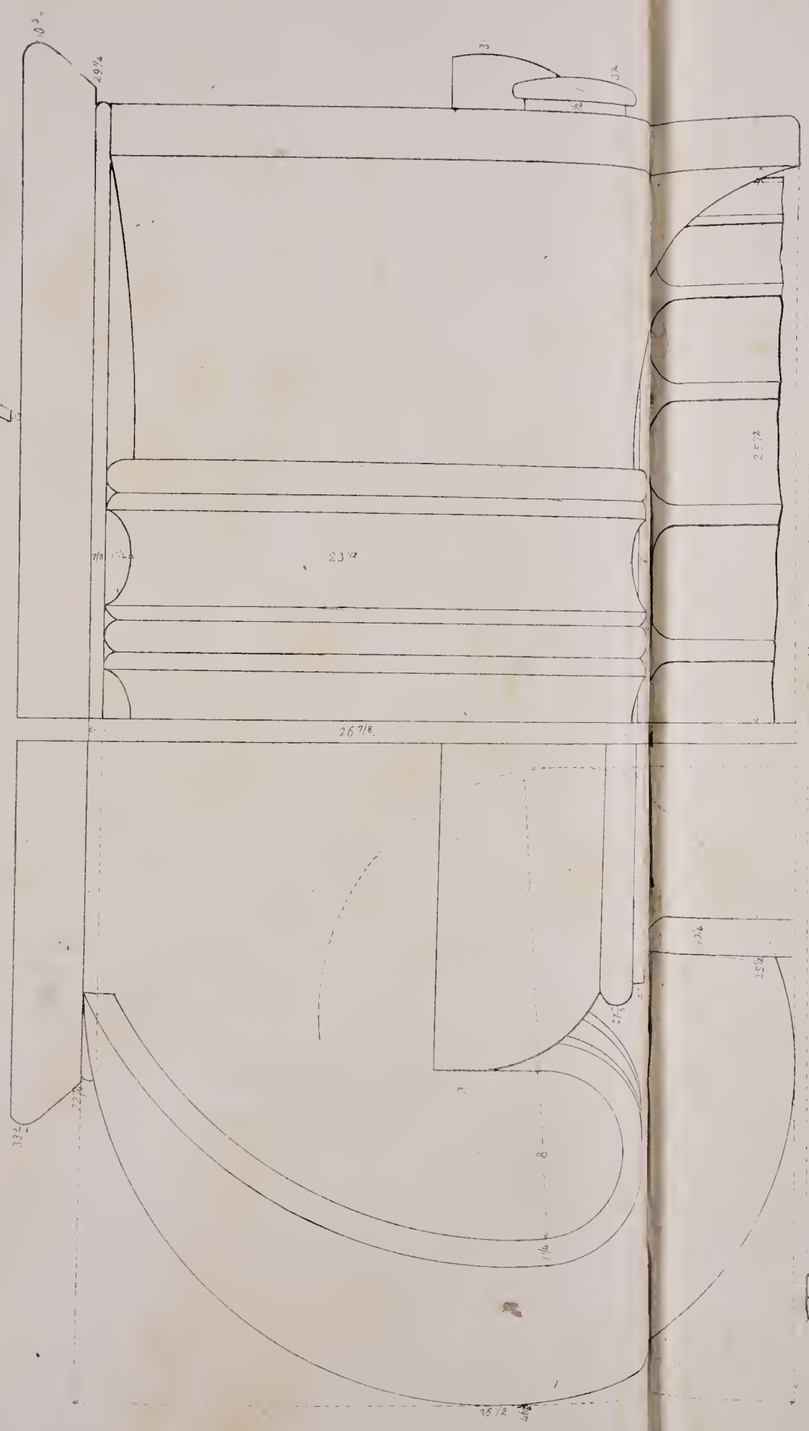
A

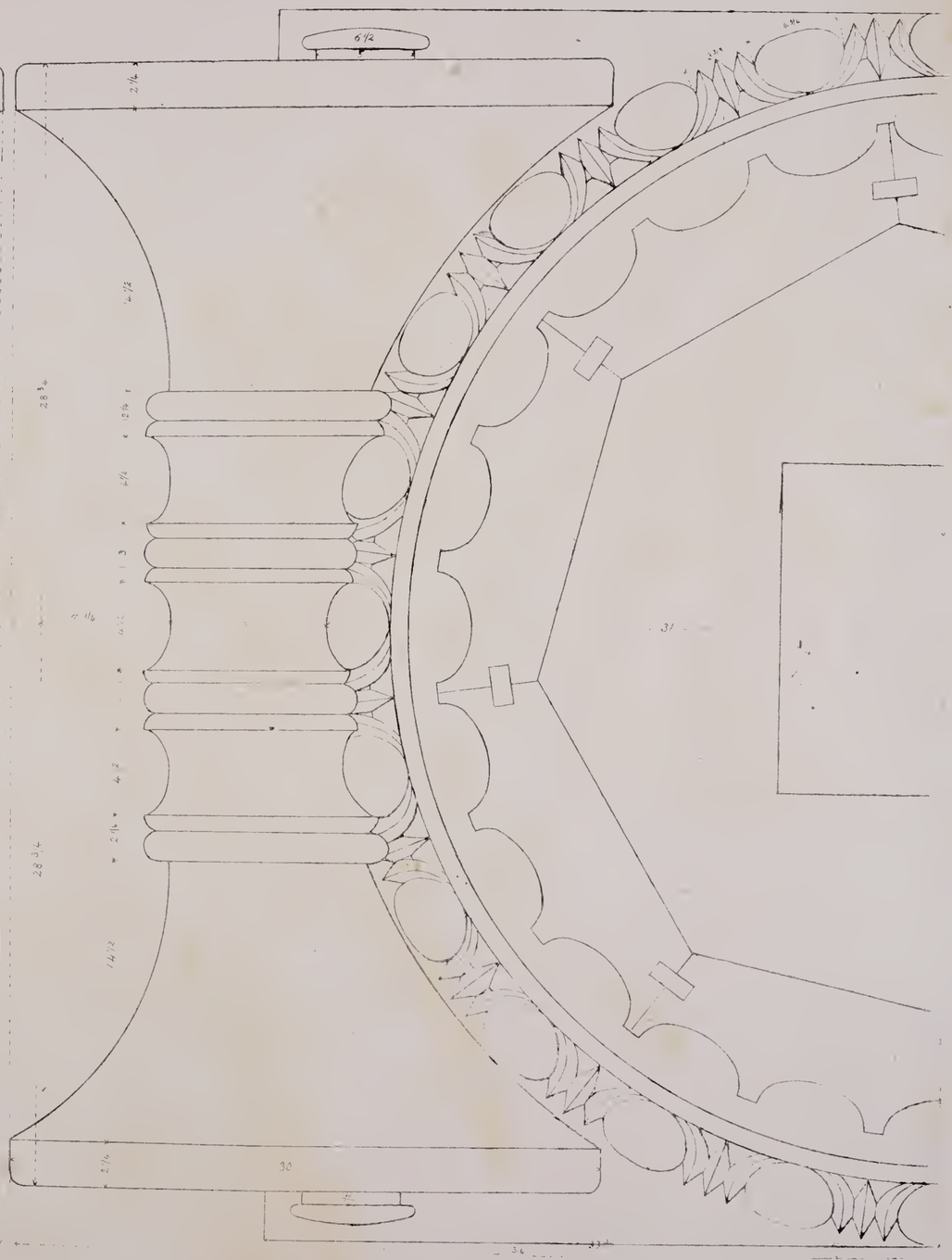
PL. 10.

GRECIAN ARCHITECTURE.

IONIC ORDER.

Temple on the River Ilyssus near Athens.





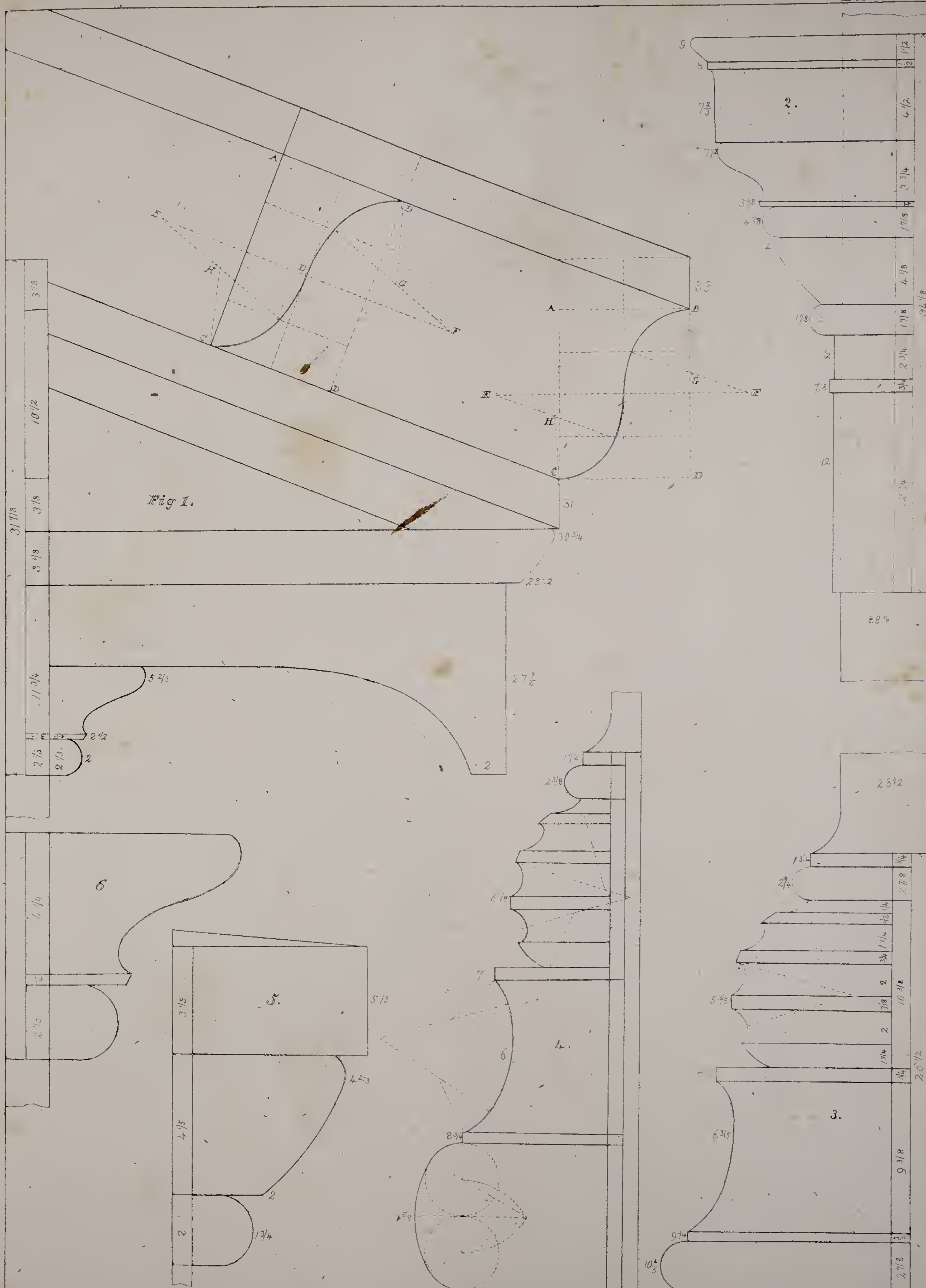
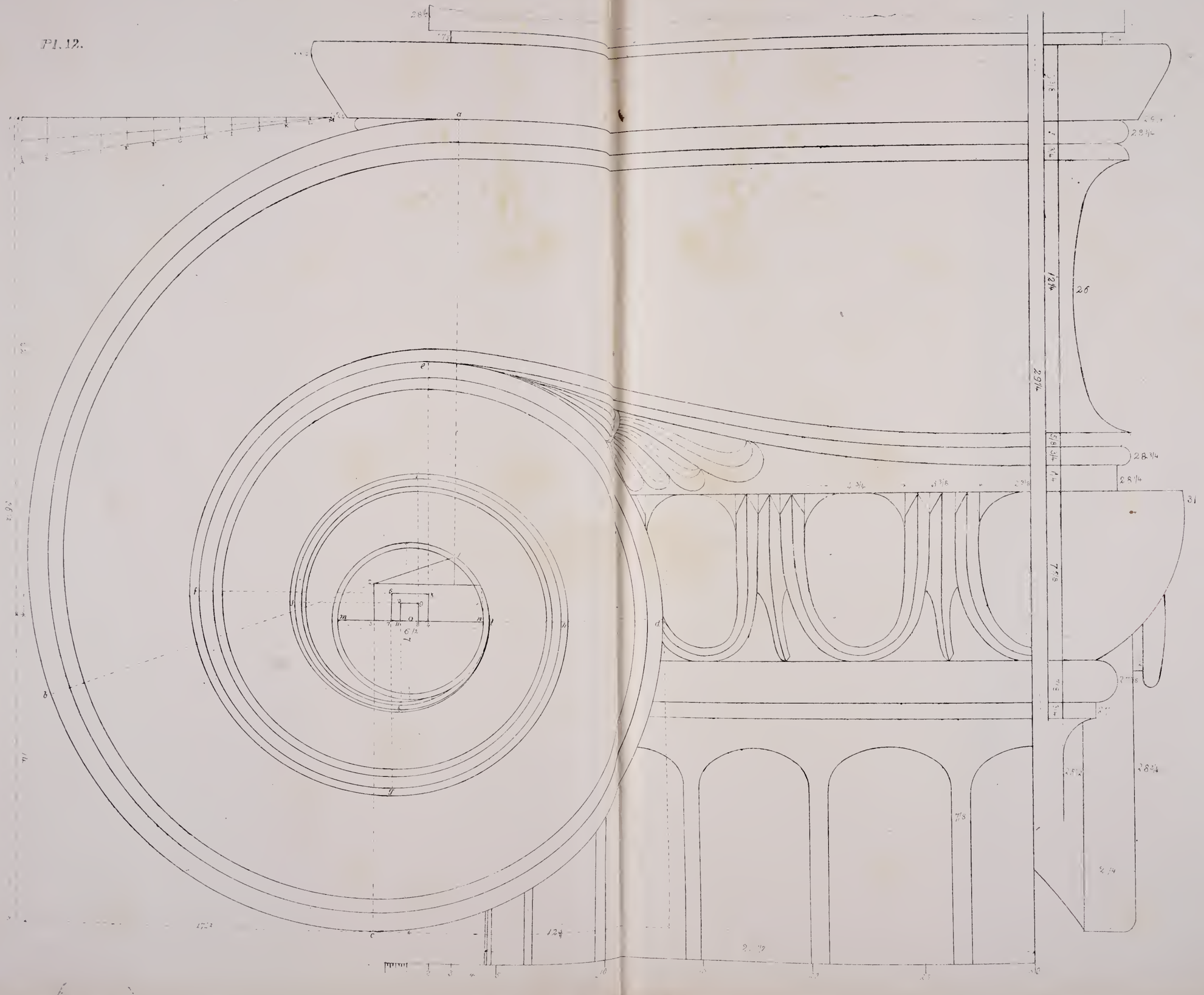
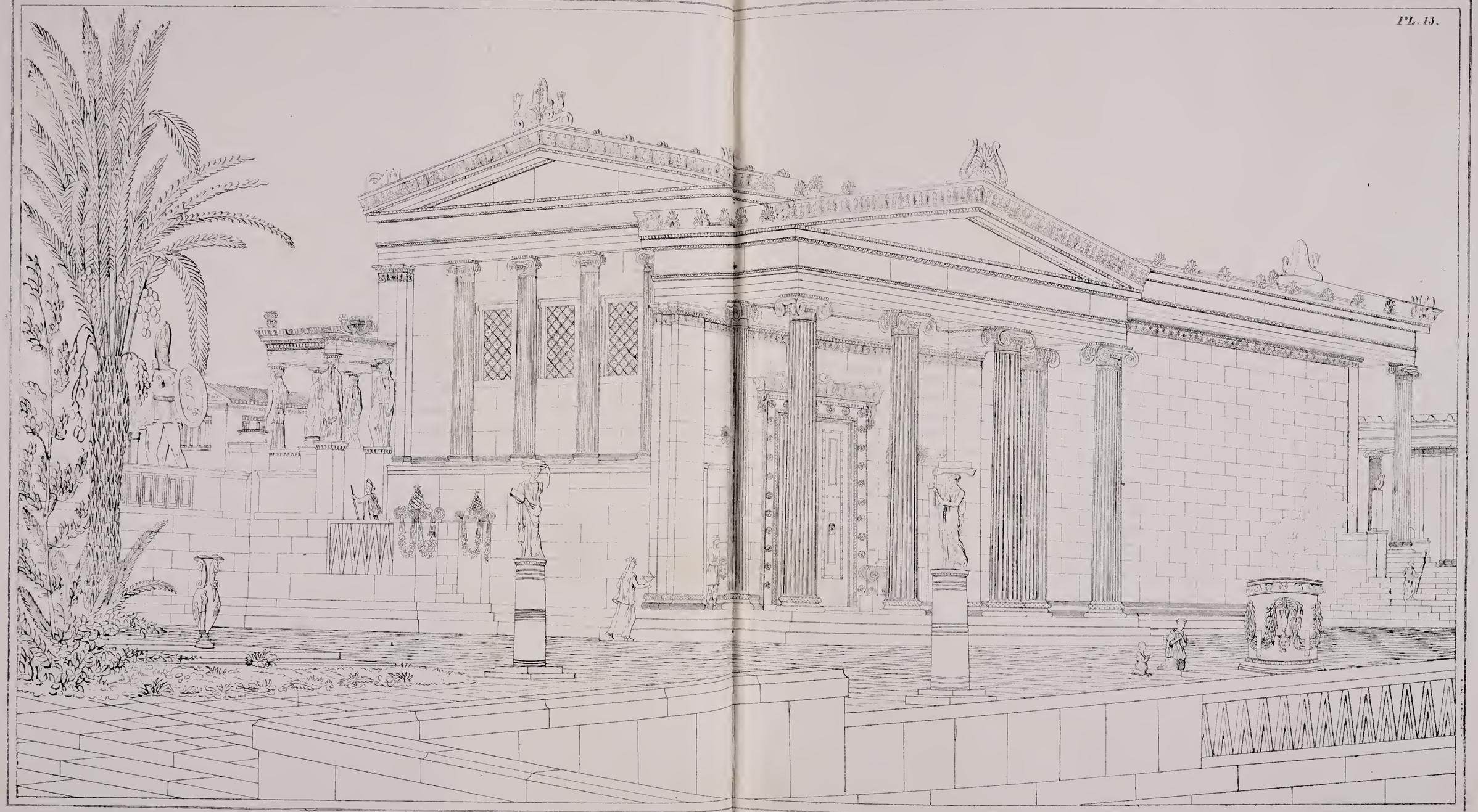


Fig 1.
2.
3.
4.
5.
6

Pl. 12.

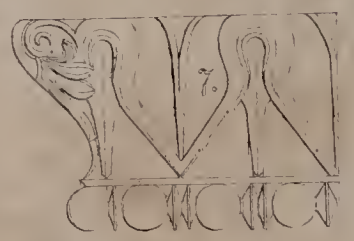


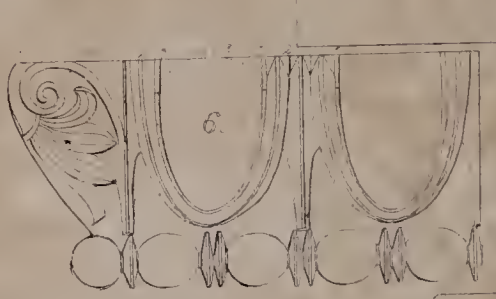


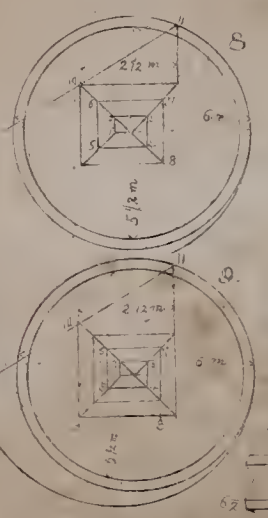
AN IDEAL RESTORATION OF THE ERECHTHEION, AT ATHENS.

Pl. 14

Fig 1.







From the Erechtheion, at Athens.

Fig. A

Fig. B.

Fig. C.

Fig. D.

Fig. E.

Fig. F.

From the Temple of Minerva Polias at Athens.

PL. 16.

Fig. 1.

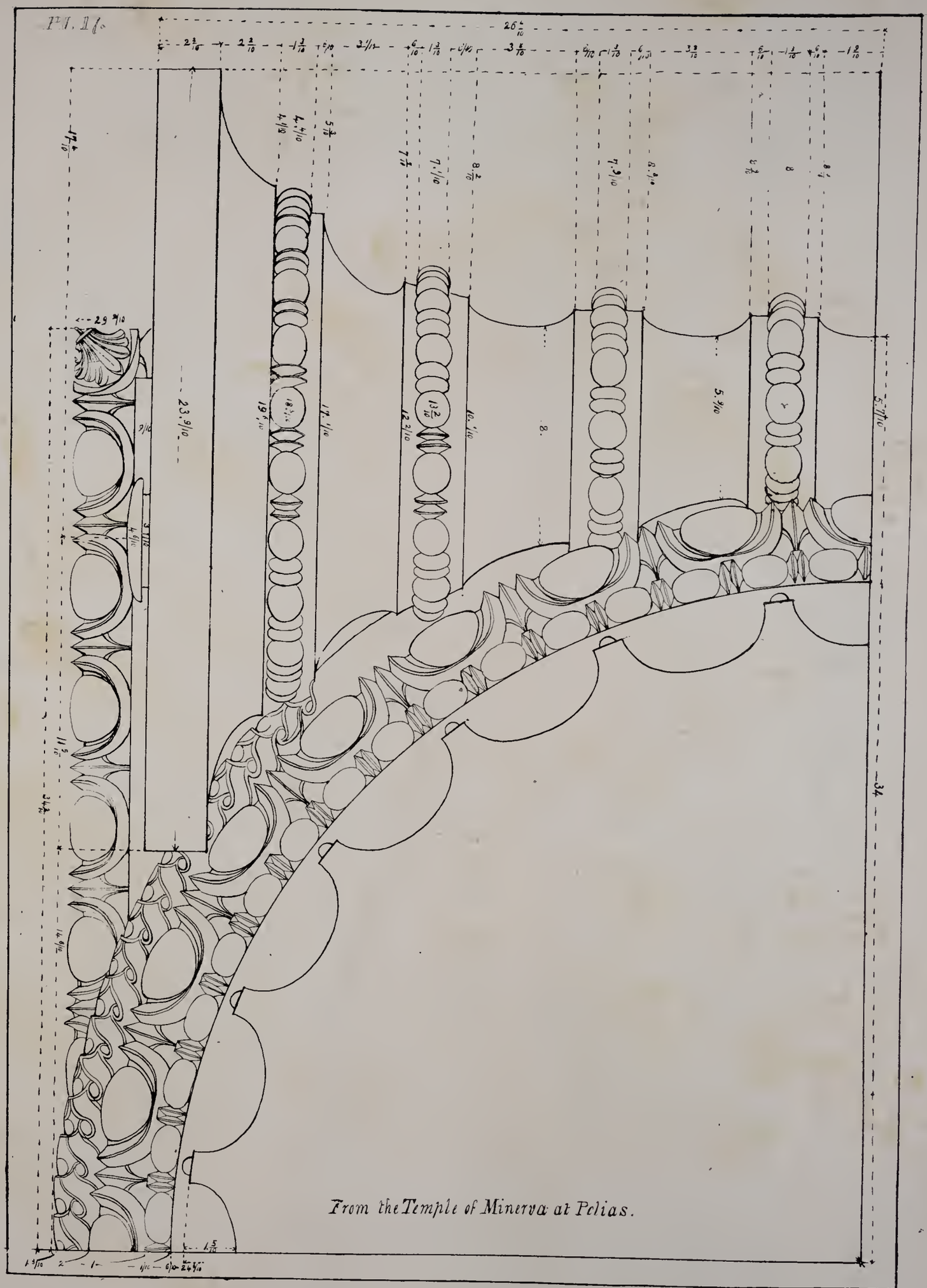
Fig. 2.

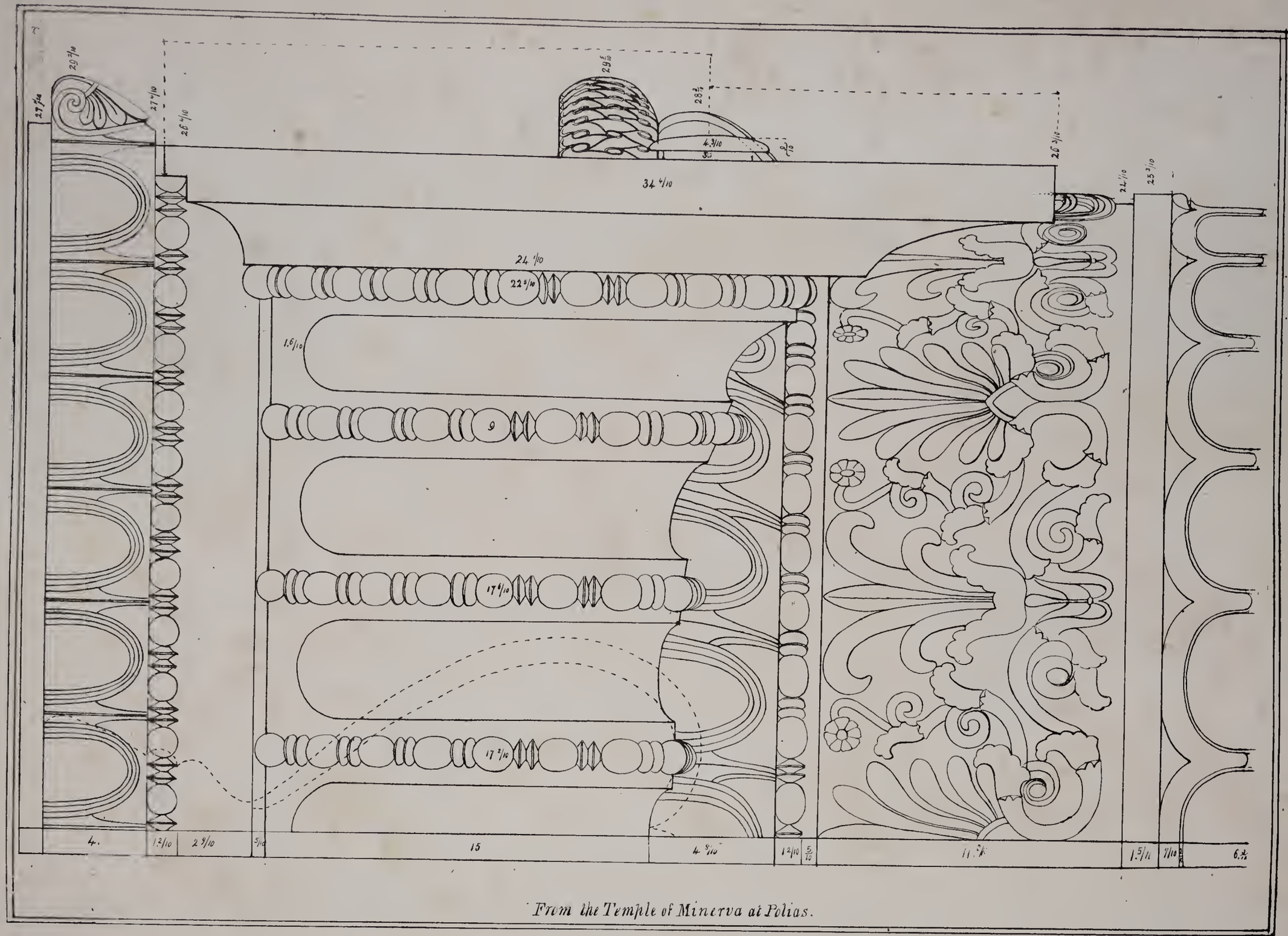
Fig. 3

Fig. 4

Fig. 5.

Scale of thirteenths


Pl. II.
From the Temple of Minerva at Pelias.



From the Temple of Minerva at Polias.

Fig. 1.

3.

2.

Fig. 3.

Fig. 2.

Fig. 4

Fig. 5

Fig. 1.

From the Temple of Minerva Polias. at Priene, in Ionia.

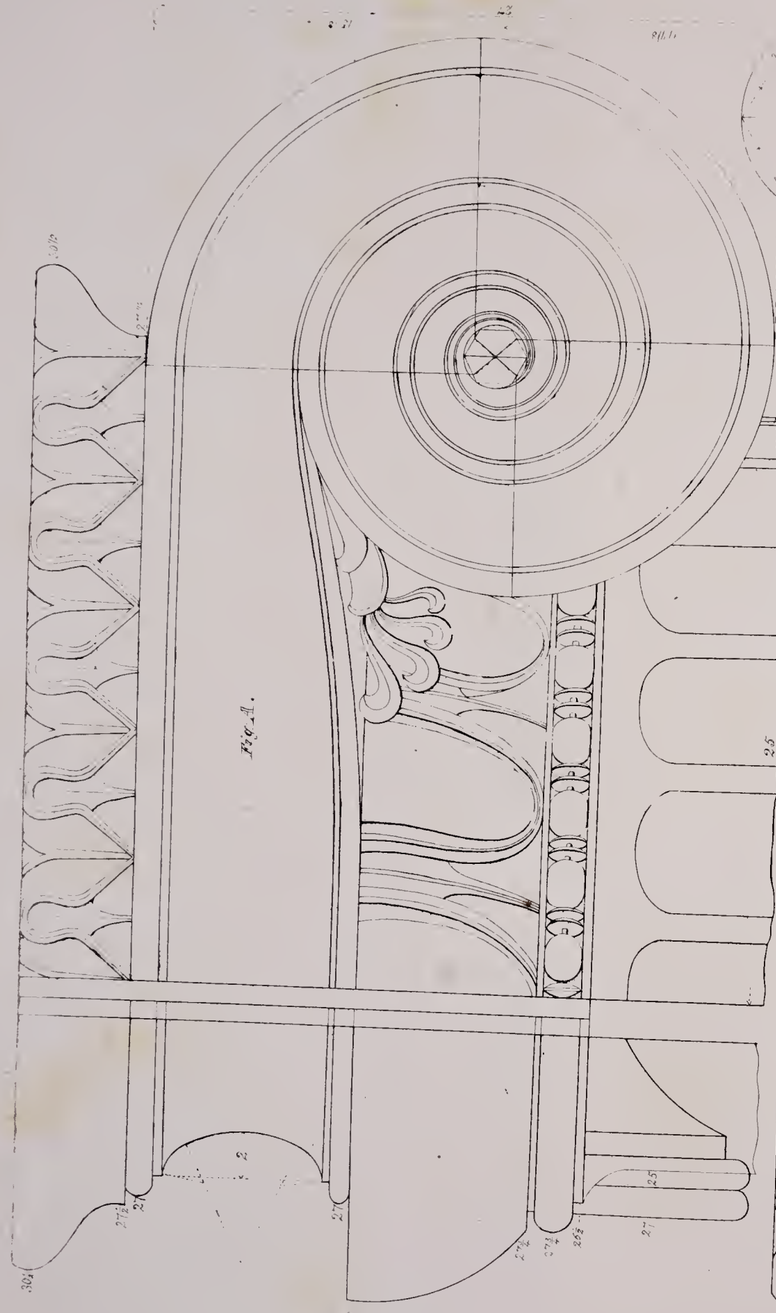
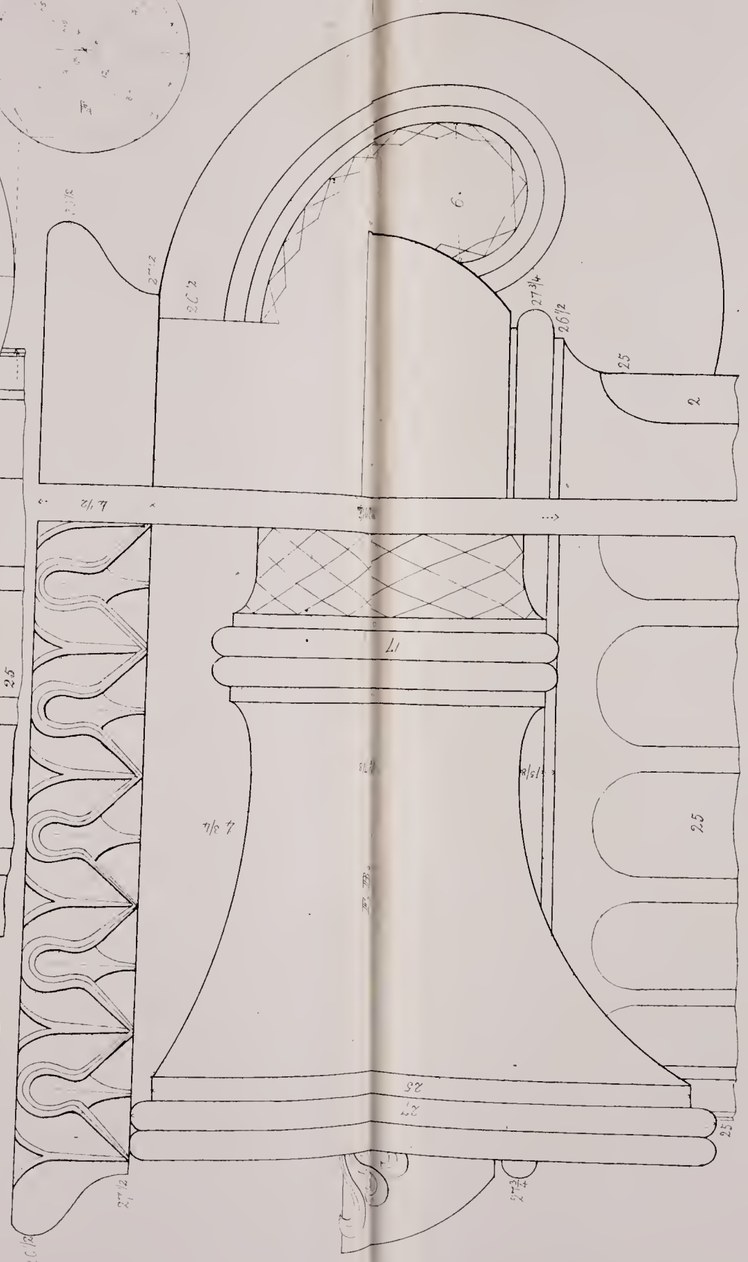
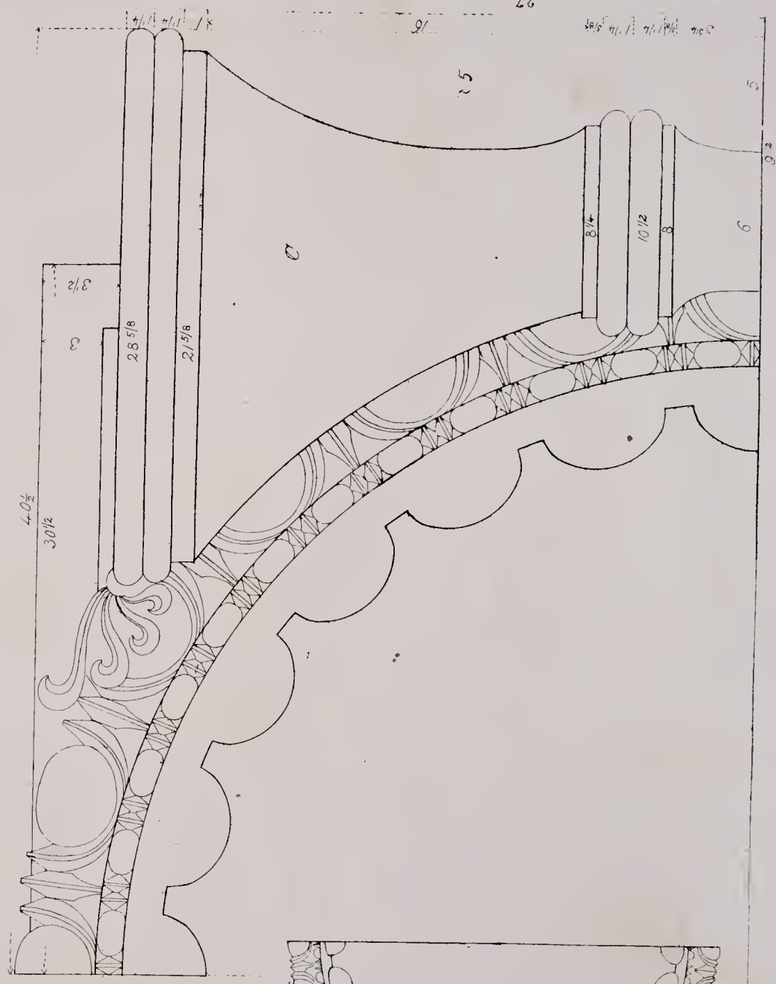
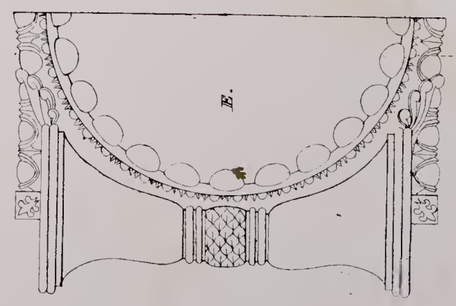


Fig. 1.





D.



E.

Fig. 6

Fig. 2.

Fig. 3.

Fig. 5.

Fig. 4.

Fig. 7.

Fig. 8.

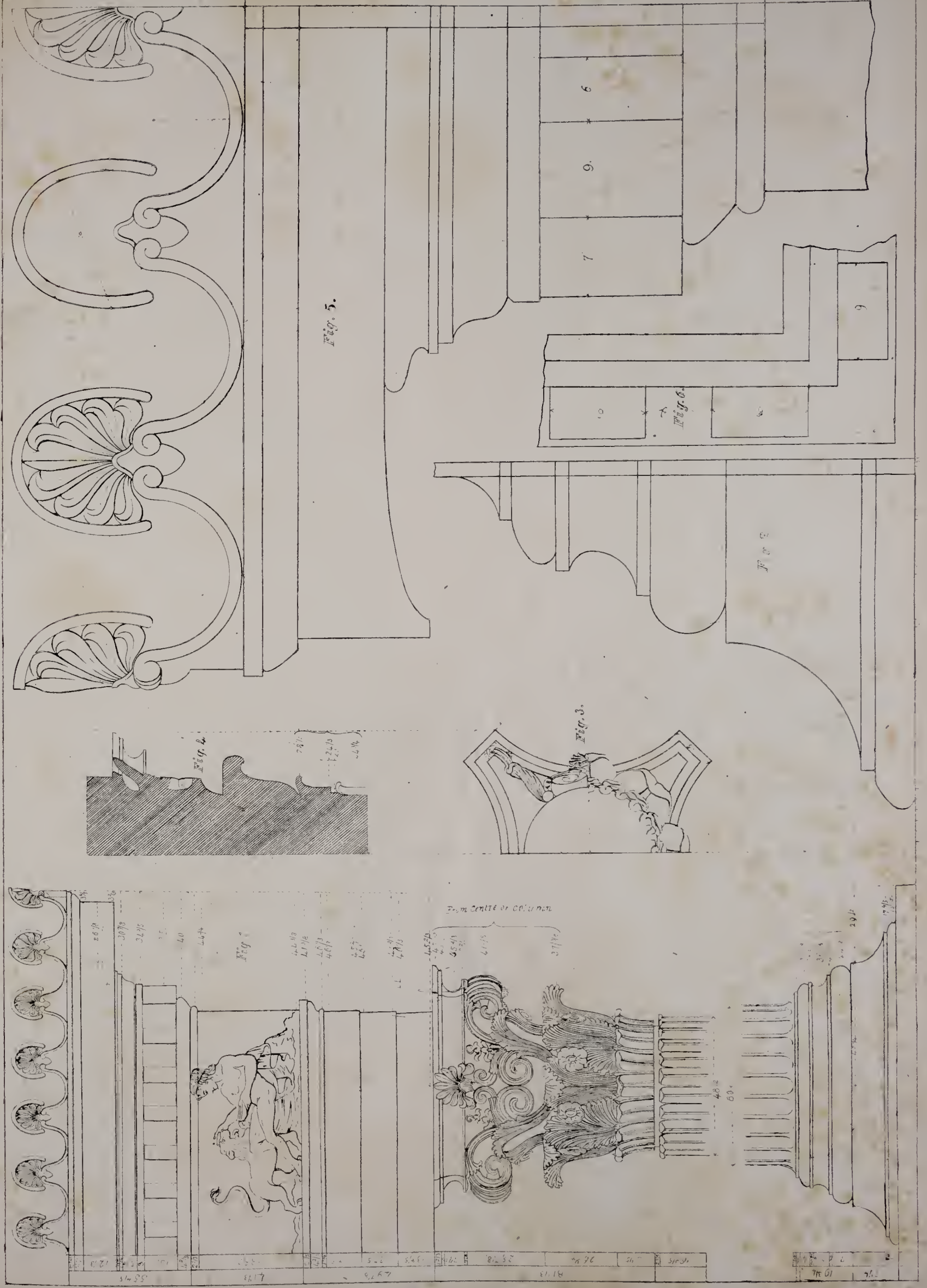
Fig. 1.

From the Temple of Bacchus at Teos in Ionia.

CORINTHIAN ORDER.

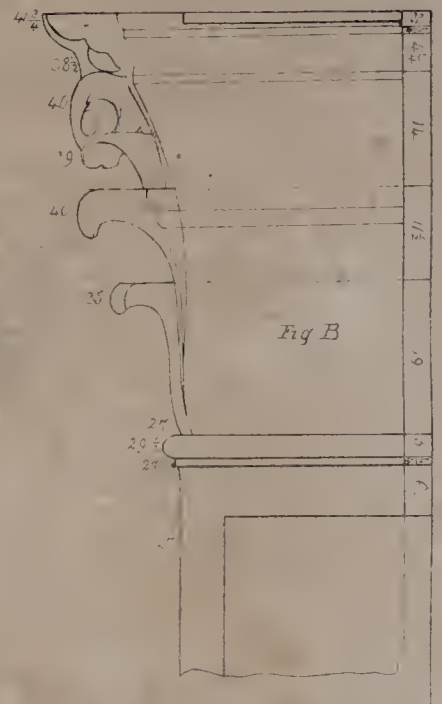
From the Monument of Lysicrates at Athens

Pl. 23.

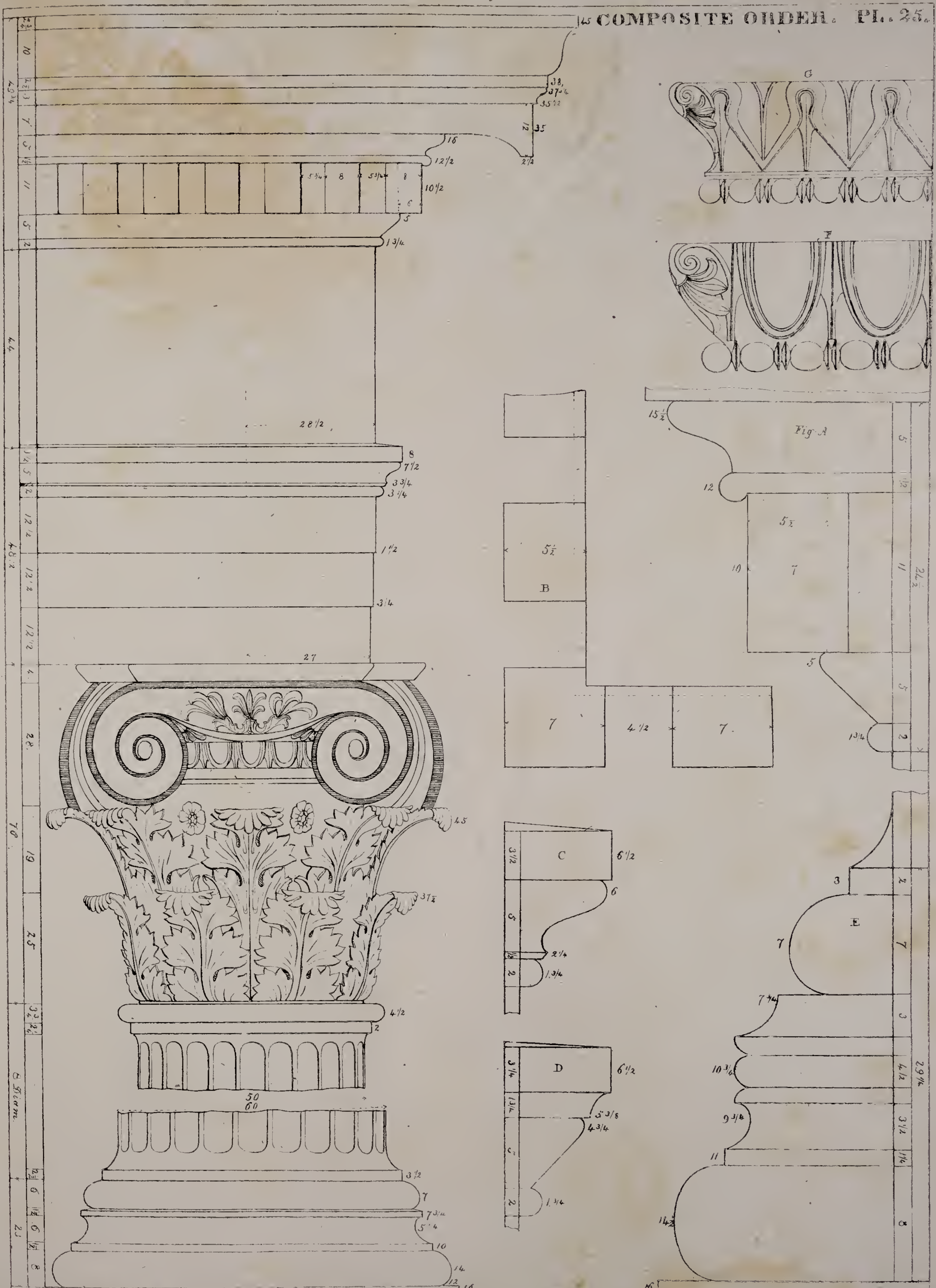


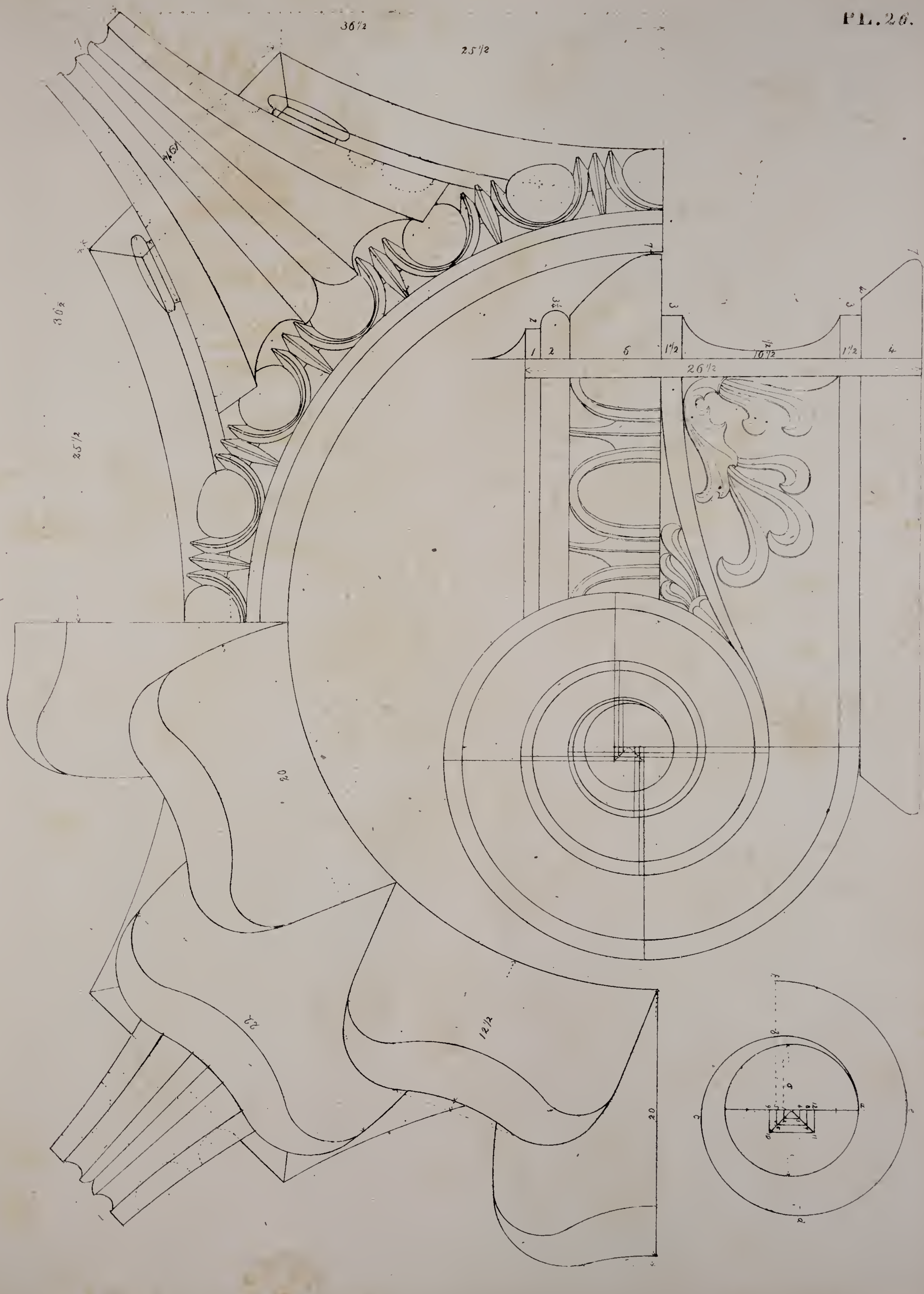
PL. 22.

CORINTHIAN ORDER.

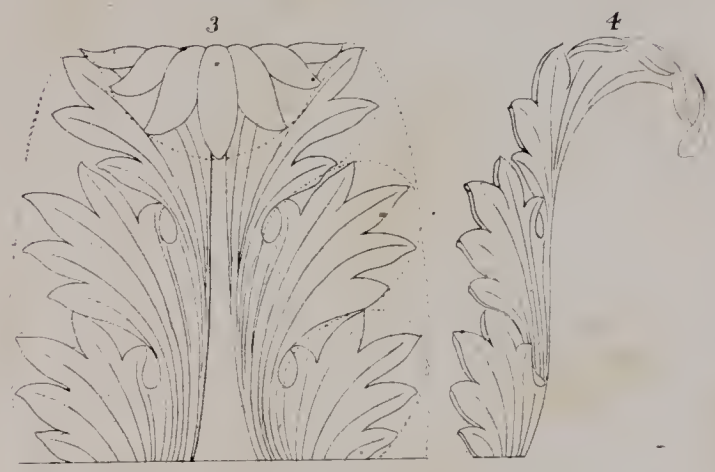


COMPOSITE ORDER. PL. 25.

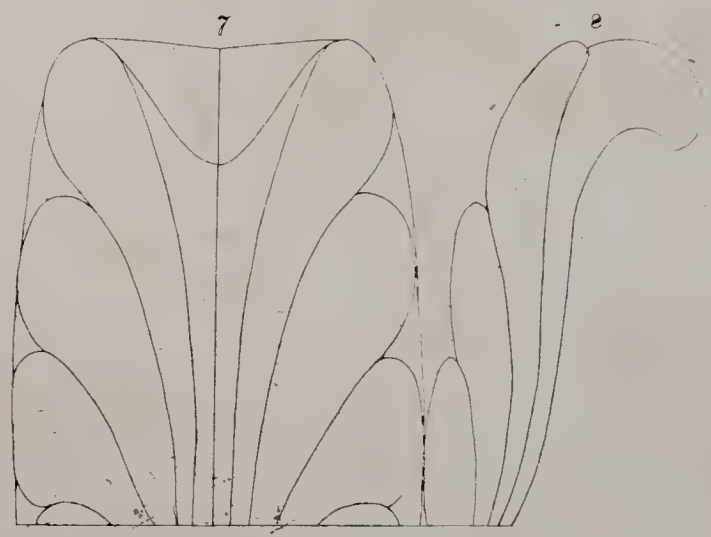



36½
25½
30½
25½
26½
1½
10½
1½
1
2
6
4
20
22
12½
20


2
1


3
4


6
5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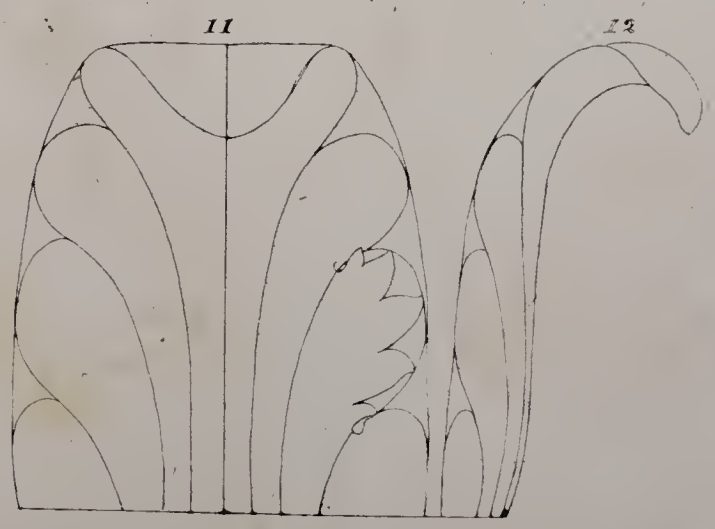
9


11
12

PL. 28.

Fig. A

A

B

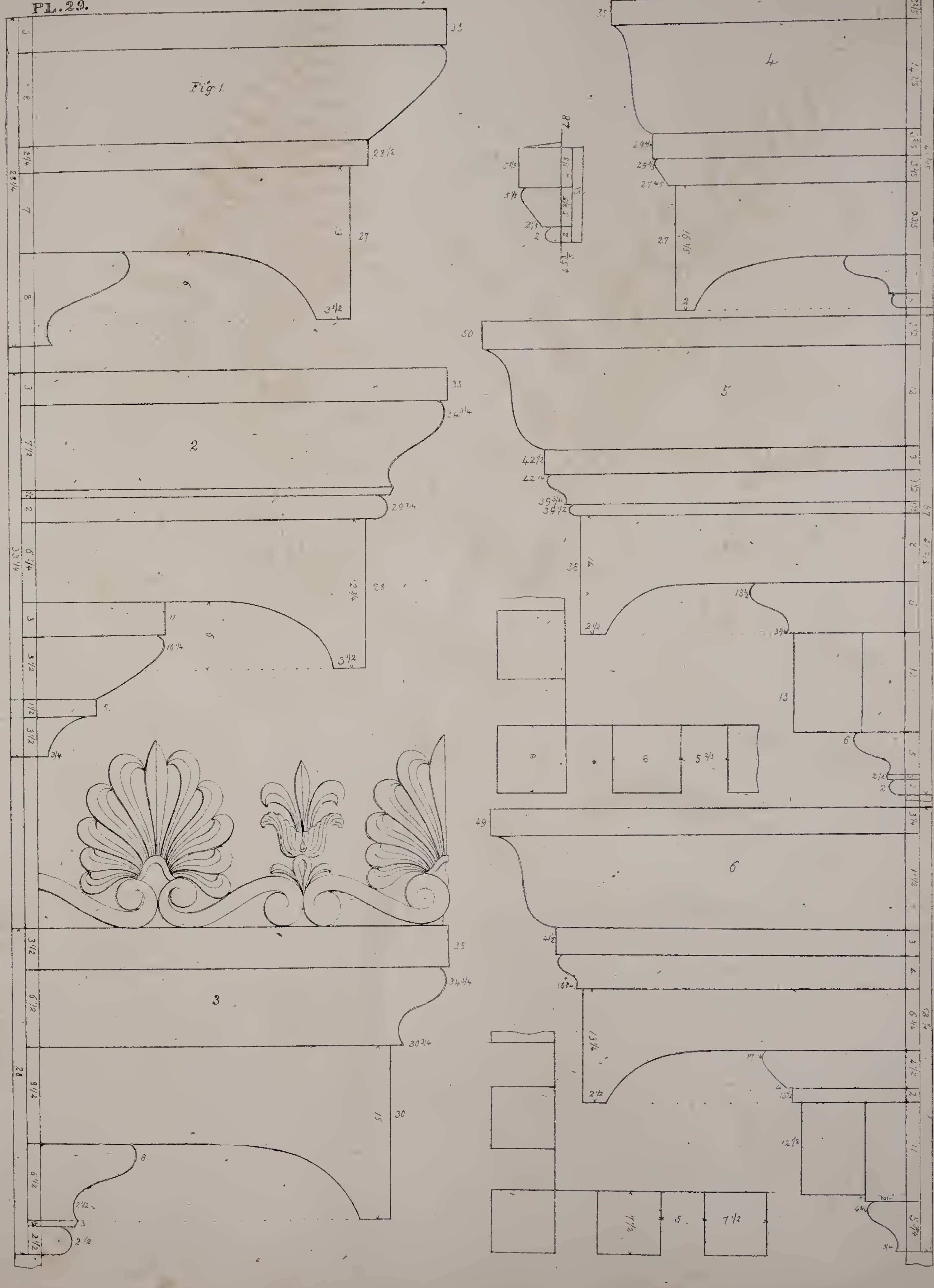
C

D

E

F

PL. 29.



TUSCAN ORDER.

Pl 36.

Fig 1.

Fig 2

Fig 3

Fig 4.

Fig 5

Fig 6

6 diameters.

ROMAN DORIC ORDER.

PL. 21.

Fig 1.

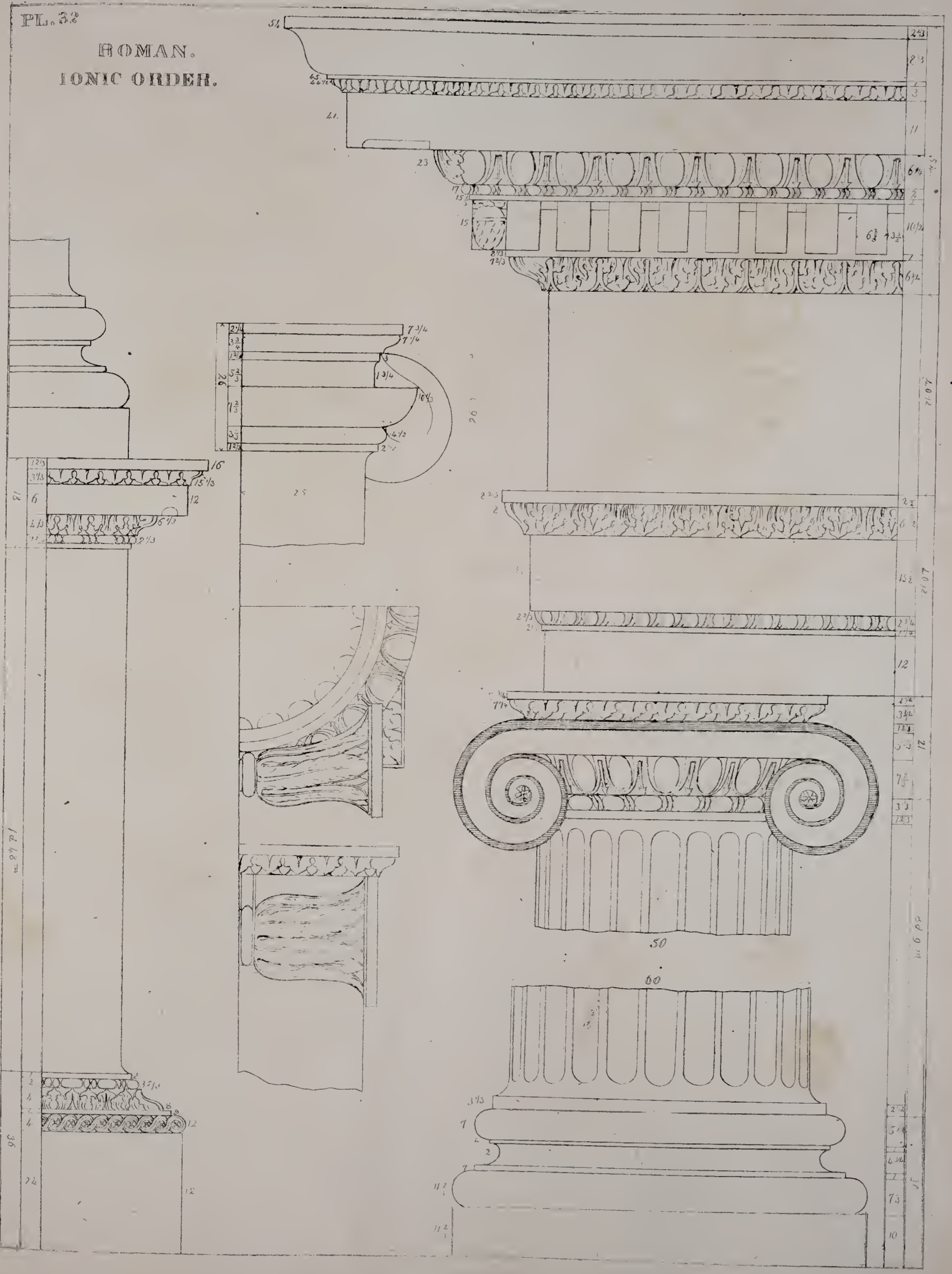
2

3

4

PL. 32

ROMAN.
IONIC ORDER.



ROMAN
or
COMPOSITE ORDER

Pl. 33

Plan of the Capital.

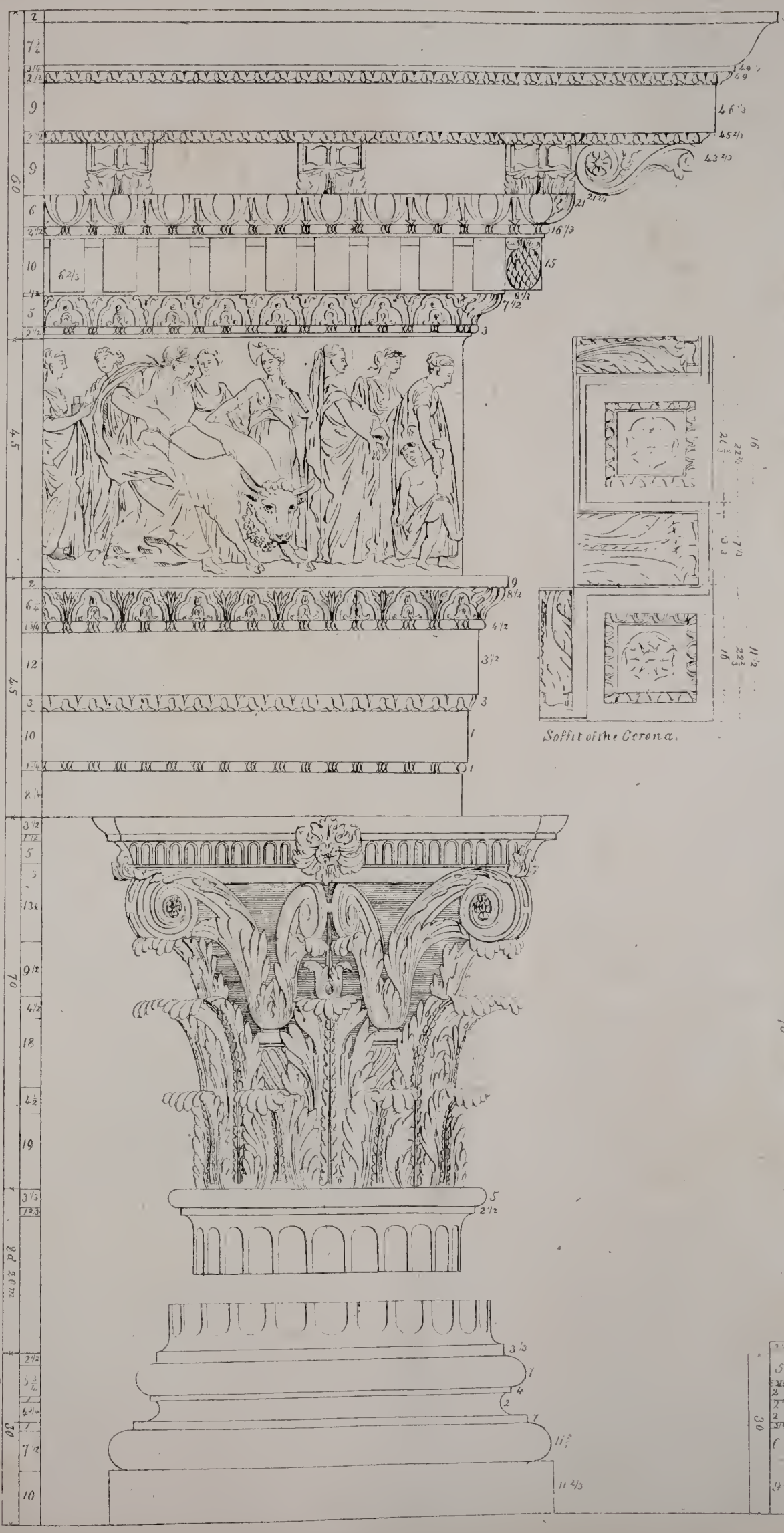
Capital of the Pedestal

Angular View of the Capital.

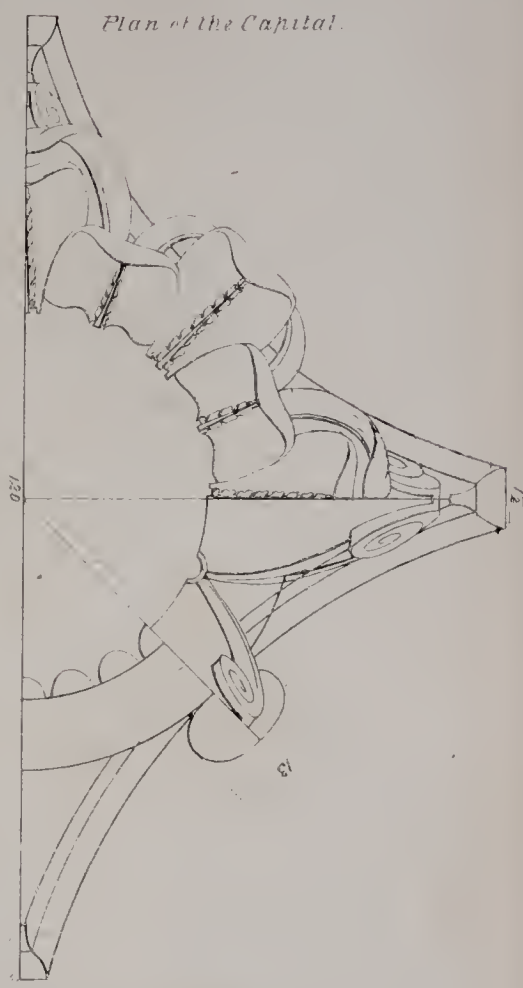
Composite Base

ROMAN CORINTHIAN ORDER.

Pl 34.

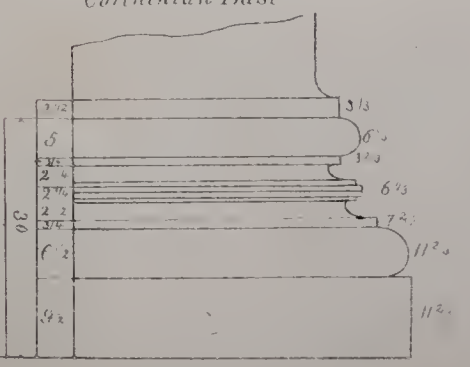


Soffit of the Corona.



Plan of the Capital.

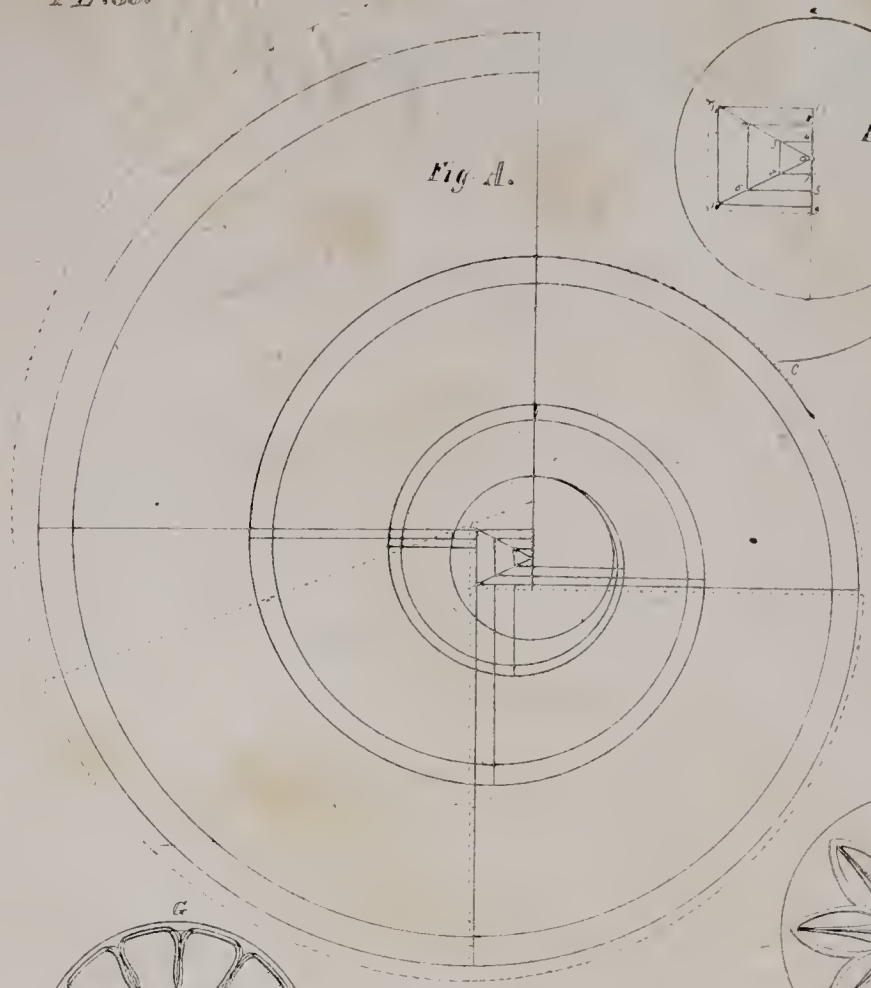
Angular view of the Capital.

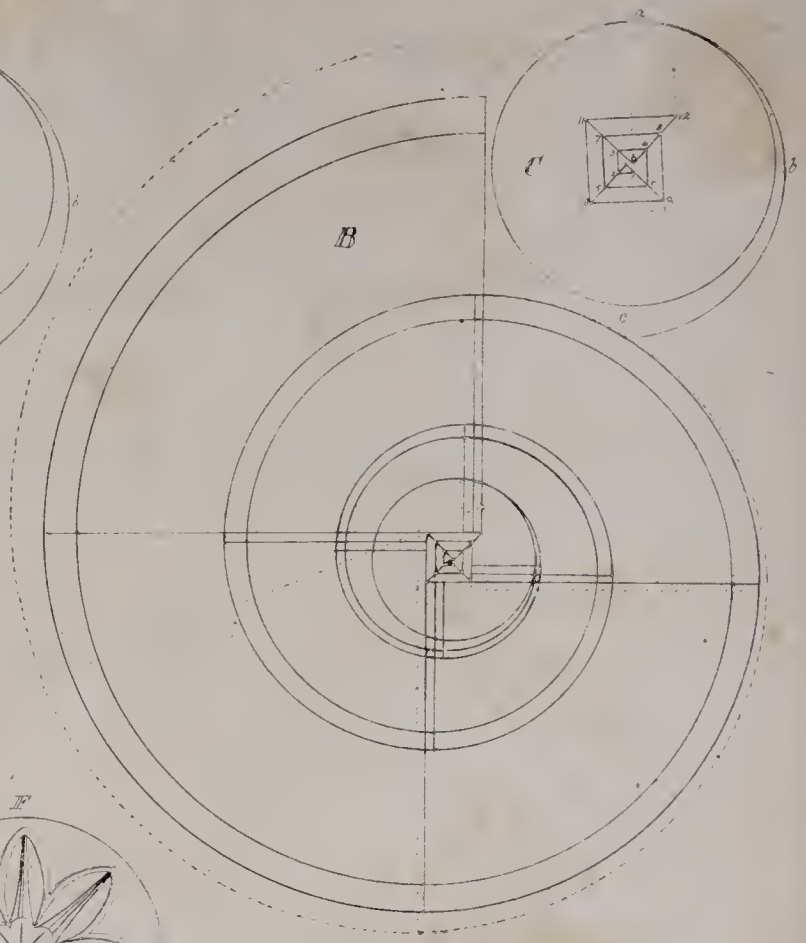


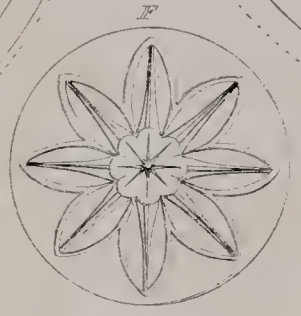
Corinthian Base

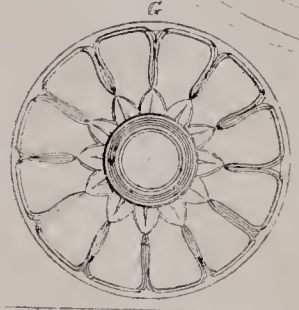
PL. 35.

Fig A.









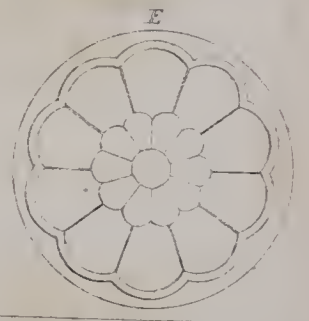


Fig 1.